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CHINESE-ENGLISH BILINGUAL CHILDREN'S ACQUISITION OF
LANGUAGE: A CASE STUDY OF AN ADVANTAGED GROUP

by



JENN-SHANN JACK LIN

A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Chinese-English Bilingual Children's Acquisition of Language: A Case Study of an Advantaged Group", submitted by Jenn-Shann Jack Lin in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Linguistics.

ABSTRACT

This study investigated a group of Chinese-English bilingual children from upper-middle class advantaged backgrounds to explore the following general questions. (1) How do the bilingual children perform on various linguistic and psycholinguistic tests in comparison to monolinguals. (2) What appears to be the effect on a child's first and second language behavior of access to two competing language systems? (3) To what extent does a wide range of external socio-cultural factors interact with bilingual behavior?

To investigate these questions, the subjects were administered a battery of tests, consisting of the Bilingual Syntax Measure (Burt, Dulay and Hernandez 1975), a bilingual syntax measure-Chinese version, a derivational morphology test, a paradigmatic/syntagmatic word association test-English version, a paradigmatic/syntagmatic word association test-Chinese version, and a code-switching test. The external factors were explored by a Questionnaire on Sociolinguistic Background and an in-depth interview.

The results of the English syntax test showed that, except for a recent arrival from Taiwan who was classified in Intermediate Level, all subjects were categorized as equally proficient as their English monolingual counterparts. The subjects' responses in the English word association test were largely paradigmatic and were comparable to English-speaking university students. In the derivational morphology test, the younger Chinese group (6-7

years old) lagged behind their English monolingual counterparts in some morphological processes, but caught up or surpassed them at a later stage. In the case of the Chinese tests, the results showed that, despite sixteen percent of the subjects having lost the active control of Chinese, almost half managed to maintain their home language.

The external factors influencing the English tests are either maturational or experiential, with the exception of the English word association test which is highly correlated with hours of reading English books per week. The external factors influencing the Chinese test are the importance assigned by parents to the child's learning Chinese and whether or not the father speaks to the child in Chinese. Passive exposure to either English or Chinese at home did not influence the productive control of either language.

Kendall correlations and Kruskal-Wallis one-way analyses of variance were conducted to test the relationships among all linguistic scores and external factors. No correlation was found between Chinese and English scores, leading to the speculation that access to two competing language systems does not have the balance-effect predicted by Macnamara (1966).

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CHAPTER ONE

STATEMENT OF THE PROBLEM

The study of bilingualism as a personal and societal phenomenon, especially in situations of conflict, is a critical area of psycholinguistic and sociolinguistic inquiry.

A. S. Dil (1972, p. xiv).

The Problem of a Bilingual Child in a Monolingual Community

The problem of bilingualism is more than acute to newly arrived immigrants in countries such as Canada and the United States; it is central to decisions that they must make about the education and socialization of their children in the new land. They require information about the influence of their children's first language on the acquisition of a second, about the functioning of the bilingual child in a monolingual society, and about what aspects of that society will help or hinder their children's fluent acquisition of the dominant language.

The problem arises especially when the new immigrants have to decide whether the ethnic language should be preserved at home and passed on to the second generation or not. The desire to preserve the ethnic language is motivated by the sense of the immigrant's national identity, for language, after all, represents the traditions, the ideals, the culture, and the proud achievements in the history of a people (cf. Arsenian 1937). This motivation can best be illustrated by a typical case such as this one cited by Chao.

I am a proud citizen of China. I speak the language of the descendants of [the] yellow Emperor. My children don't speak Chinese, because I speak Fukienese and my wife speaks the Shanghai dialect and so we have to speak English to them. But we teach them some characters and constantly remind them that their first loyalty is to China. They just happened to be born here when we were travelling here. We are sad that we can't go back now, but there will always be a China and "That's where you belong," as I always tell my children. (Chao 1968, p. 5, emphasis added).

Another case, this one reported in Kuo, that sums up a similar motivation is more dramatic. This couple "brain-washed" their children because, as they explain, the preservation of the Chinese language and culture

is a problem of identity. You are Chinese. With your yellow face, no matter what you do..., you may even become an American citizen, still you are a Chinese ... For our children, they see Chinese [the language] as 'our'

language and English is for conversation with American people. They are proud of speaking Chinese ... of course, we 'brain-washed' them. (Kuo 1972, p. 123).

Besides supporting the sense of national identity, language has value as a tool for acquiring human knowledge, and this is another motivation for preserving the ethnic language. It is commonly held that no single language "can claim the possession of the entire wealth of human culture and civilization, or be so foolish as to assume the responsibility for its progress" (Arsenian 1937, p. 13). To know more than one language is to have one more key to the treasure of knowledge. It is an asset rather than a liability, especially if a child can pick up the language at home effortlessly, Chao argues, why throw away such a good opportunity? (Chao 1968, p. 231).

Still other parental attitudes towards the value of bilingualism, reported in Kuo (1972), are even more optimistic and are in line with the current position held by psychologists such as Lambert and his associates (1972), and their followers. These people believe that "the access to and use of two languages in early childhood might accelerate some aspects of cognitive development" (Cummins and Gulutsan 1974, p. 260) because of a positive transfer of skills across languages and the opportunity for comparing and contrasting the two languages. Other parents, if not as enthusiastic as the ones mentioned above, are confident

that, although the bilingual child may be slower in his initial development, eventually he is destined to catch up with his monolingual counterparts in control and use of the second language (cf. Kuo 1972, p. 116)

Despite some parents' enthusiasm for, and some psychologists' favorable advocacy of bilingualism, the following case of confusion described by a parent and reported in Kuo (1972) poignantly pictures for us the psychological problem parents fear for their bilingual children.

Bilingual environment might have some negative influence on her intelligence. For instance, she was confused for a while in counting numbers when she started to learn to count in English. Some confusion and interference were obvious. Now she uses only one system, that of English, to count. We don't want her to be confused (Kuo 1972, p. 116).

(These doubts and worries have not been resolved by the investigative literature on the problem. Certain of the early I.Q. studies on bilingual children, cited in Darcy (1953, 1963), and Peal and Lambert (1962), seemed also, according to the researchers' interpretation, to indicate that on some I.Q. tests, particularly on verbal tests, the bilinguals performed at a lower level than their monolingual counterparts, leading to fears that bilingualism had detrimental effects on the bilinguals' intellectual development; other studies, especially more recent ones,

however, secured just the opposite results (Peal and Lambert 1962). Critics of the earlier studies (Peal and Lambert 1962, Taylor 1976) suggest that the early verbal I.Q. tests were likely to have been standardized on middle-class English-speaking children. The majority of the bilingual subjects were from families of low socio-economic status. Such children, even monolinguals, do not perform equally well on such tests as those from the higher social class. Furthermore, the children were tested in English before they had adequately mastered English. The test results certainly were affected by such factors and weighted in favor of the monolinguals, according to Taylor. To sum up, the mixed experimental findings of the I.Q. studies were, in fact, contradictory. What is more, they--probably incorrectly--ascribed the bilinguals' poor performance to the wrong factor: to bilingualism per se, rather than to socio-economic status or knowledge of English.)

Also associated with the psychological problem of bilingualism is the question of its influence on the emotional adjustment of bilingual children. Peal and Lambert (1962) point out that bilingualism had a positive effect on their Montreal bilingual subjects, who were found to be more broad-minded towards speakers of other languages. A similar view was also expressed by some Chinese parents interviewed by Kuo (1972). The bilinguals who have low proficiency in English, however, are bound to have adjustment problems,

because school education is based on English. With limited English, they find it difficult to follow what is going on in school and cannot communicate with other pupils. This kind of emotional problem is poignantly expressed by an immigrant girl student who said,

I feel very lonely at times, especially that having language difficulties I can't develop close friendships with people of my own age. After seven months in a new country I am still lonely and a bit lost (Ashworth 1975, p. 73).

In addition to this emotional adjustment problem associated with deficiency in English, socio-cultural adaptation is another problem that the bilinguals have to face. Their strange accent, behavior, dress, food, and value system can be immediately recognized by North-American-born children, who may be interested in and curious about this foreignness, but who exert peer-group pressures on the immigrant child who longs chiefly for anonymity in his new group. To cope with this problem, many immigrant children try to learn to use two different behavior and value patterns, one in the home and the other in the school and the community (cf. Krear 1969, Ashworth 1975). As the children grow older, the values of the adopted society will become more and more influential. As a matter of fact, the numerous forceful influences of the school, the TV, the channels for entertainment, and reading, as well as many other daily experiences of the immigrant children, pressure them continually to adopt English and the value system of the

host society (cf. Kuo 1972, Ashworth 1975). When the conflict between the language and values of home and school cannot be resolved, the immigrant children, of course, suffer (Ashworth 1975). Linguists, sociologists, parents, and educators alike are confronted with the task of assisting these immigrant children to become bilingual and bicultural and to go freely from one language and culture to the other.

Bilingualism may also present another and more specifically linguistic problem, that is, linguistic interference. Linguistic interference by the first language, together with interference by instruction, second language learning strategies, second language communication strategies, and overgeneralization of the target language rules and semantic features, was proposed by Selinker (1972) to account for the different forms produced by the second language learner. The immigrant children not only have to overcome the problem of linguistic interference, they have also to learn different styles of English: playground English, schoolroom English, literary English, written English, and so on. The more English they learn, the greater will be the number of educational, professional, and social opportunities available to them (Ashworth 1975). Learning the correct stylistic alternates can be difficult, however, since the immigrant children are also burdened with the tremendous challenge of learning new cultural structures to

appreciate the proper and appropriate use of the styles.

All these psychological, educational, socio-cultural, and linguistic problems of bilingualism constitute questions to be addressed in the challenging study of bilingualism and its effect, for good or bad, upon the bilingual immigrant child. It is so intricate a topic that Mackey (1968) rightly remarked, "there is no autonomous discipline encompassing the linguistic phenomenon of bilingualism."

Defining Bilingualism

Before going on to discuss the main problems concerned in the specific study to be reported in this thesis, and the motivations for doing this particular investigation, it will be useful to define some concepts and terms. Bilingualism itself is a very general term, and is applied to a wide range of language behaviors. Weinreich (1953) viewed bilingualism as "the practice of alternately using two languages." Bloomfield (1933, p. 56) characterizes bilingualism as "a native-like control over two languages." The Bloomfieldian definition certainly is too narrow to encompass the behavior of the majority of those who are usually credited with bilingualism (cf. Diebold 1961, p. 99, Wald 1974, p. 301). It might have served, however, as a basis for those who created the notion of and studied the

so-called "balanced bilinguals" (cf. Peal and Lambert 1962, Cumins and Gulutsan 1974). In these papers, the term balanced bilingual refers to someone who has equal competence in two languages, with special reference to the equal degree of their linguistic achievement in both languages, i.e., native-like control of, or the lack thereof, both languages (cf. Lambert and Anisfeld 1969, p. 125, Macnamara 1967, p. 60). This definition is limited, in that in a real bilingual community there are not many bilinguals who are proficient to the same degree in the two languages used (cf. Arsenian 1937, p. 19, Diebold 1961, p. 99). Rather, a bilingual usually speaks one language better than the other (Leopold 1939, pp. 6-7), and can thus be said to have one dominant language and one weaker language.

To understand the process of becoming bilingual, Diebold (1961) argues, one has to postulate a stage of "incipient bilingualism." To elucidate what "incipient bilingualism" means, Diebold (1961) cites his study of the Huave Indians of Oaxaca, Mexico, as an example; his Huave subjects had the ability to give a large number of Spanish lexical equivalents to native Huave words, but they were not necessarily able to produce well-formed utterances in Spanish. Wald (1974, p. 303) suggests that this phenomenon seems to imply that bilingualism may start with the acquisition of the lexical items of the second language without the mastering of syntactic and phonological rules

necessary to produce complete meaningful sentences.

Another type of bilingualism, the so-called "receptive bilingualism," is discussed in Macnamara (1967, p. 59). Receptive bilinguals are those who can understand but cannot speak one of their languages. This type of bilingualism, as Macnamara explained, "typically occurs in homes where the parents are immigrants to a country which differs in language from their country of origin" (p. 59).

In summary, bilingualism might usefully be taken as a continuum of abilities to manipulate two languages, with Bloomfield's definition, "native-like control of two languages," as one pole, and Diebold's postulation of "incipient bilingualism" as the opposite. In between the extremes there is only the degree of bilingualism in a range of bilingual situations. This notion may turn out to be useful in describing a real bilingual community such as that of the Chinese community in Edmonton, Alberta, Canada, who constitute the subjects of the study to be reported in the body of this thesis.

The delineation in the preceeding paragraphs of the problems of being bilingual and the range of manifestations of bilingualism point out the dilemma that the newly arrived immigrants face. It is more than clear that parents are obsessed with the question of whether the bilingual child

is able to function adequately in school and in his peer group using the community language (cf. Marckworth 1977b, p. 2, Kuo 1972, p. 116). Their decisions about what is best for their children in regard to the maintenance of the ethnic language, and, indeed, any decisions by teachers, school-boards, etc., about the management and education of the bilingual child, must be based upon solid evidence about the abilities and behaviors associated with immigrant bilingualism. Though limited in scope and objectives, this study was proposed, therefore, to investigate aspects of the linguistic behaviors of a group of Canadian-Chinese immigrant bilingual children residing in Edmonton, Alberta, and the possible relationship of these behaviors to external socio-cultural variables. The principal object of this investigation is exploration. The following general questions are of particular interest.

1) How do the bilinguals perform on various linguistic and psycholinguistic tests in comparison to monolinguals?

2) What appears to be the effect on a child's second language behavior of access to two competing language systems, i.e., is there any effect, and if there is, what is the nature of this effect? Is it an enhancing or an interfering one?

3) To what extent does a wide range of external socio-cultural variables interact with or determine bilingual language behavior?

4) How will such a study shed light on the problem of divergent definitions of bilingualism?

These questions are the ones with which parents of bilingual children are most concerned; they are also of interest to the linguist, who is concerned about the bilingual child's language acquisition, its rate, pattern and content, as compared with that of the monolingual child; to the psycholinguist who is concerned about the language process as it may be revealed by the acquisition and production pattern (cf. Marckworth 1977b, p. 1); and to the sociolinguist who is concerned about language socialization (cf. Kuo 1972, p. 1). To carry out the investigation, four language behavior tests were administered to a population of bilingual children from the community noted above. These were an English derivational morphology test, Chinese and English syntax tests, Chinese and English syntagmatic/paradigmatic word association tests, and a code-switching test. As well, various questionnaires designed to examine extensive socio-cultural variables which might impact on language behavior were administered. The content and rationales of these tests and questionnaires will be fully treated in Chapter Three. To find out to what extent the socio-cultural variables and bilingual language behaviors interact, a set of Kruskal-Wallis and Kendall statistical analyses were carried out to disentangle the complex interrelationships among these variables. The application and results of the statistical analyses will be treated in Chapter Four. In this manner it was hoped that the conflicting evidence regarding bilingualism and its

linguistic, social, and psychological manifestations could be reduced to some reasonable order.

CHAPTER TWO

REVIEW OF RELATED STUDIES

An Introduction

The history of the study of bilingualism is not a short one. In its modern context it can be dated back at least as early as the turn of this century. A comprehensive review of the literature is thus beyond the scope of the present work. This chapter will treat only a selective sample of empirical studies which are related to this thesis. Basically, the selection was made according to the following considerations. First, such studies should have direct bearing on the problems stated in Chapter One. Second, they should be empirical in nature. Based on these two principles, the review will be organized into four sections: studies of Chinese-English bilinguals, of bilingualism and intelligence, of bilingualism and linguistic proficiency, and of the role of an ethnic language at home.

Studies of Chinese-English Bilinguals

One of the earliest studies of Chinese-English bilinguals was carried out by Yeung (1921). The specific purposes of Yeung's investigation were to find out the general intelligence level of Chinese children in the vicinity of San Francisco, to compare the intelligence scores of these children with norms for American children of similar socio-economic status, and to see whether sex differences existed in the Chinese sample (p. 267). Yeung gave the Stanford Revision of the Binet Scale to 109 Chinese children in the vicinity of San Francisco during the spring of 1921. The subjects ranged from five to thirteen years old and were all American-born. Sixty-two were boys and forty seven were girls. Most of them came from parents of lower socio-economic status. The Chinese language, customs, beliefs, and manner of worship were all retained in the homes of these children. According to Yeung, "the Chinese children master[ed] the English language readily" (p. 207).

The results revealed no striking differences in the intelligence of Chinese and American children. Both groups performed at about the same level. Yeung also obtained the results of the Binet tests given to several other racial groups in the vicinity of Stanford University and compared these results with his own data. He found that the Chinese markedly outperformed the South Europeans and performed as

well as the North Europeans. The median intelligence score for the Chinese group was 97 in comparison with 99 as found by Terman for the unselected American children. A sex difference was not clearly indicated by the data because the numbers were too small for interpretation, although there was a slight bias in favor of the girls. The correlation between intelligence and socio-economic status for the Chinese was considerably lower than that found with American children. Yeung explained that the coefficient of correlation is lowered "because large numbers of the Chinese children test in intelligence above their social and economic status" (Yeung 1921, p. 273).

Interesting as it is, Yeung's study has to be interpreted carefully. It has two limitations. First, in using the Binet tests, the vocabulary tests were intentionally omitted, since Yeung claimed that they were unfair to the Chinese children, thus "necessitating a small change in the scoring of the tests" (p. 267). Furthermore, Yeung did not control for the factor of age. Among 109 subjects tested, forty-nine were nine to ten years old and thirty-three were twelve to thirteen, representing the largest groups in the total sample. The remaining twenty-seven were of various other ages from five to thirteen. Because of the sampling method for age, the median intelligence computed by Yeung for the total Chinese sample was 97, a figure unsurprisingly close to that for the nine

to ten year old Chinese subgroup; that is, the median intelligence score computed by Yeung represents that of the subgroup rather than the total group, because the nine to ten year old Chinese subgroup was overrepresented. It is, therefore, fair to suggest that the sampling technique was actually biased.

Another early experimental investigation of the verbal abilities of Chinese-English bilinguals was done by S. L. Wang (1926). Wang was interested in knowing whether there is a language bias involved in comparing racial groups by means of a verbal intelligence test. He administered Ohio State University I.Q. Test to thirty-four Chinese, 150 black American students, forty-five students born in Russia, and also to white American students matched for age, sex, and year of study at the Ohio State University. Wang claimed that his Chinese subjects scored significantly better than any of the other racial groups mentioned above on the test of number series, which involved very little language usage, and that they performed as well as the paired American white students on the test of arithmetic problems. These Chinese-English bilinguals were, however, decidedly inferior to the paired white American students on tests of proverbs, dissected sentences, and general information which not only demanded a high level of linguistic sophistication but also in-depth knowledge of American life and customs. Wang concluded that his Chinese subjects were not inferior

compared to other racial groups in terms of non-verbal intelligence tests; however, they were undoubtedly handicapped by language difficulty (p. 105).

Wang's study, just like that of Yeung, represented a pioneering enthusiasm coupled with rudimentary experimental design and statistical technique. His subjects could be described as a highly selected sample, as he himself admitted (p. 106). Taking this factor into account, we have to interpret the superiority of the Chinese bilinguals' performance on arithmetic problems and number series cautiously. Another intrinsic difficulty with the experimental design was that Wang did not carefully control other variables such as socio-economic status and language background. We do not know, for instance, where these Chinese bilinguals were born, brought up, and educated originally. This limitation made further generalization virtually impossible. More detrimental is the lack of developmental information about the Russian group (cf. Wang 1926, note 3, p. 105). If it were the case that these Russian subjects were in fact brought up in America and spoke only English at home and school, this group then could not serve as a viable experimental group. Finally, we are also not clear how many American students served as the control group. We would like to know for sure that the control group was not underrepresented or overrepresented. In spite of these weaknesses, Wang did raise one important

issue regarding bilinguals' verbal and non-verbal abilities which is still much alive in contemporary studies of bilinguals and bilingual education. That is, what is the real effect of bilingualism on measured intelligence?

In the studies of Chinese-English bilinguals, Madorah E. Smith and her students have made important contributions. Smith, who has spent a lifetime in bilingual studies, began by studying some American children in Iowa who were either born or had lived in China and consequently had become bilingual (1931, 1935). She found that the English vocabularies of her subjects were below average, and their linguistic development was retarded due to the change of environment (Smith 1931, p. 187). Smith later studied the Chinese-English bilinguals in Hawaii. Chun (1935), one of Smith's students, reported that in informal English conversation her bilingual subjects used shorter sentences than monolinguals of the same age. Motoyama (1940) found that her Chinese-English bilingual subjects were below average in terms of their vocabulary size. The higher the bilingual scores, that is, when Chinese was spoken more at home, the worse the children performed in the vocabulary test. Motoyama's study is important in that it appears to point out the powerful influence of home language on children's English vocabulary acquisition. Her suggested interpretation has a contemporary echo in the controversial problem of Spanish-English bilingualism which will be

briefly reviewed in the next section. Theoretically, the factor of an ethnic language spoken at home might be seemingly as detrimental as Motoyama claimed; its effect on academic achievement is less certain, however. Smith (1942) interestingly confirmed our criticism. Smith obtained bilingual scores, aptitude scores, and the grade-point ratios (presumably the grade point average) of students who studied at the University of Hawaii. The subjects consisted of Koreans, Japanese, Chinese, Hawaiians, and Caucasians. Smith observed that "the least and next to the poorest English is used in the homes of the students of Japanese ancestry" (p. 357), next for Koreans, Chinese, Hawaiians, and Caucasians last. On the college aptitude test the Caucasians ranked first, Chinese and Japanese next, and the Hawaiians and Koreans last. As for the grade-point ratios, the means for the various ethnic groups were 2.28 for Chinese, 2.26 for Caucasians, 2.33 for Japanese, 1.96 for Hawaiians, and 1.92 for Koreans. Smith concluded that "the grade-point ratios were higher in the case of those Chinese and Japanese who attended ethnic language school" (p. 363). Smith's study thus seemed to suggest that a bilingual background did not have detrimental effects on academic achievement.

In two particularly interesting papers (Smith 1939, 1957), Smith stated that in 1933 her subjects of Chinese ancestry were bilingual, whereas by 1957, their counterparts

knew hardly any Chinese and actually were monolinguals. "The only Chinese words used by more than three children were those by which they called their grandparents" (Smith 1957, p. 258). In 1933, Smith observed a verbal deficiency in her subjects, but in 1957, the new generation was found to be almost as proficient as their American monolingual counterparts in terms of length and complexity of sentences, command of vocabulary, and the ability to use aspects correctly; however, the speech of the new generation "is still contaminated by pidgin English so that they still make too high a percent of errors for their age" (p. 258). Unfortunately, we are here left unclear as to what Smith referred to when she spoke of "pidgin English" and where children were exposed to it. Was it a substandard English spoken at home or that spoken in the streets? If the new generation had been contaminated by "pidgin English" spoken at home, the use of ethnic language as the home language might be more appropriate. We will treat this topic in detail in the next section.

A dissertation done at the University of California at Berkeley by Chen (1964) appears also to demonstrate that bilingualism has a detrimental effect on bilinguals' performance on English tests. Chen set out to investigate the effects of bilingualism on linguistic skills as measured by English tests. He selected 160 Chinese students attending Westlake Junior High School in Oakland, California, as his

subjects. These subjects were either monolingual English speakers or Chinese-English bilinguals. He administered to these students the 1957 revision of the California Reading Test, Form W, which provided three scores: a reading comprehension score, a reading vocabulary score, and a total reading score. The experimental results revealed that monolinguals are decidedly superior to bilinguals on all three scores. Chen concluded that "bilingualism is a factor in the inferior performance of the bilinguals." This study seems to be questionable in experimental design. First of all, it did not control for socio-economic factors which have been repeatedly shown to be correlated with linguistic development and intelligence (McCarthy 1954, Jones 1960, Cazden 1965). In addition, age and sex are also important variables which should be taken into account, and they were also ignored in this study. Nevertheless, it presents a negative effect of bilingualism on second language performance which needs to be explored.

Contrary to Chen's (1964) findings, Kline and Lee (1972) reported that their subjects had not been adversely influenced by bilingualism. They studied "dyslexia, defined as reading disability occurring in a child who has adequate intelligence, vision, and hearing, and is without brain damage or primary significant emotional disability," in Chinese children in Vancouver, British Columbia, who were simultaneously learning to read and write in English and

Chinese (p. 9). After a full day studying in public school, these children stayed for two hours in one of the three private Chinese language schools to read and write Chinese and to learn Chinese culture and history. The total number of subjects in this study was 277; 136 of them came from Strathcona Public School and were attending a private Chinese language school; 141 were from public schools other than Strathcona studying in the Mon Keang Chinese Language School. All of the subjects took the Iota Oral Reading Test, which indicates reading disability. A Chinese version of the Iota was also devised, standardized, validated, and used to determine the children's ability in reading Chinese. In addition, the authors administered seven additional tests to those students showing reading disability. The family background of the subjects was also studied by asking the parents to complete a questionnaire. From the returned questionnaire, the authors were able to report that Chinese was the language spoken in the homes of ninety-two percent of the children almost exclusively and most of the time in the other eight percent. The subjects were also found to be from the families of the same socio-economic level.

The results of the study revealed that the incidence of disabilities was as follows: (a) in Chinese only, thirteen percent; (b) in English only, nine percent; (c) in both languages, six percent. Combining the figures, the total having trouble in English was fifteen percent, and the total

having difficulty with Chinese, nineteen percent. This amount of dyslexia in a population is considered by Kline and Lee to be insignificant for two reasons: (a) the national incidence of English reading disability as reported was 14.7 percent; (b) possibilities of measurement error in the studies should be allowed.

It is interesting to note that only six percent of the children in this study had difficulty in both languages and their incidence of reading disability at the end of grade three was much lower than the reported national average. All of these children spoke both languages; many of them even spoke Chinese more fluently than English, according to Kline and Lee. More surprising is the fact that the children at Strathcona School, which is almost completely Chinese in population, consistently have the highest scholastic average in the Vancouver Public School system. Consequently, the authors argued that there is no need to fear that bilingualism might confuse the children and create problems in learning to read.

Reasons to account for the discrepancies between the experimental results of Chen (1964) on the one hand and Kline and Lee (1972) on the other are not that difficult to find. First of all, the studies are different methodologically. Chen made an intra-comparison; that is, his experimental (bilingual) and control (monolingual)

groups are both Chinese. We do not know, therefore, whether his bilingual subjects would underperform or outperform white American students. Furthermore, we are not clear whether or not these bilingual students have academic problems in school. It may be the case that Chen's subjects, though being unfavorably evaluated, are satisfactory students in terms of academic achievement. If so, Chen's argument then represents a hypothesis too strong to be substantiated. On the other hand, Kline and Lee's finding that the children at Strathcona School, which is almost completely Chinese in population, consistently have the highest scholastic average in the Vancouver Public School system is surprising. This finding seems to be in line with Smith's (1942) observation in Hawaii, however.

If Kline and Lee (1972) seem overly optimistic about bilingualism, Ramsey and Wright (1970) are less so. After studying language backgrounds and achievement in Toronto schools, Ramsey and Wright reported that the Chinese students of recent arrival from outside Canada, when compared with other ethnic groups such as Canadians, Germans, Greeks, Italians, and Portuguese, "are most successful on the tests of computational skills and the progressive matrices; their ratings by teachers are lower and their scores on the Picture Vocabulary Test are very low" (p. 9). Ramsey and Wright concluded that in evaluating the academic achievement of Chinese students, "no clear

patterns were observable on the basis of language alone" (p. 31). Notice that Ramsey and Wright did confirm Wang's (1926) finding that the Chinese bilinguals might be handicapped linguistically, but they are certainly not inferior in the tests involving less linguistic sophistication. This finding also points out the complexity of studying bilingualism (cf. Mackey 1968).

One of the most important sociolinguistic studies of Chinese-English bilinguals reported in the literature is that of Kuo (1972). Aiming "to investigate the bilingual pattern and its variations among preschool Chinese children in the Twin Cities area," Kuo administered a modified version of the Peabody Picture Vocabulary Test (PPVT) in both English and Chinese forms to his forty-seven subjects. A modified form of the Hoffman Bilingual Schedule (1934) was adopted to measure the family bilingual scores. In addition, intensive interview techniques were also used in data-collection. Kuo's findings supported the notion that the family is highly influential "in the bilingual socialization of the child." If the parents used more English in their conversation between themselves and with the child, or in reading stories to the child, if they were naturalized American citizens, if they had more years of experience in the United States, and if they served more American food in the family, the child tended to be more proficient in English than in Chinese. Kuo also found that,

when the family was Chinese-oriented the child would learn more Chinese but not less English. On the other hand, when the family was English-oriented, the child might learn less Chinese, but not more English. The family environment was more influential in the child's learning of Chinese (Kuo 1972, pp. 156-157).

Kuo's findings also revealed that the child's English ability increased with age, while his Chinese proficiency "tended to level off when the child was older." Kuo reasoned that when the child grows older the extra-familial influences then become more and more important to the child, and consequently the predominant impact of the family tends to decrease (cf. Ashworth 1975). Therefore, it is possible to predict that,

soon after the child starts grade school, his ability in English will reach a level comparable to the norm of other monolingual American children, while his Chinese language ability may remain constant or start to decline (Kuo 1972, p. 157).

Finally, Kuo reported that his statistical analysis did not suggest that the learning of one language affects, positively or negatively, the learning of another language, because the child learns one language from the family and another from outside the family (p. 157). In short, Kuo's study does not support Macnamara's balance-effect hypothesis (1966) which predicts that "if a child develops skills in one of his two languages, he generally pays for it by a deficit in the other" (p. vi).

The Kuo study represents one of the most thorough and important sociolinguistic investigations of Chinese-English bilinguals to date, not the least for its acknowledgement of the fact that social factors are important in the study of language behavior--a fact often ignored in the previous studies. It has several limitations, however, as Kuo himself admitted (pp. 160-164). Firstly, his subjects were mainly from families of the upper-middle professional class whose homogeneity certainly prevents further generalization about the role of socio-economic status in language behavior. Secondly, the PPVT is only a test of "hearing vocabulary" which is a very small dimension of the total range of linguistic abilities. Finally, Kuo points out that many parents of his subjects suggested that "early school years, instead of preschool years, were the most disturbing years for both children and their parents in terms of bilingual experience" (pp. 163-164), possibly because as soon as the bilingual children are enrolled in the school, they immediately have to confront independently all the psychological, educational, socio-cultural, and linguistic problems which are not apparent when they are protected and sheltered in the home. Further research along this line, therefore, is desperately needed, according to Kuo (p. 164). The present study may help to fill this gap.

The above brief review of the studies of

Chinese-English bilinguals reveals that in most of the early studies, the Chinese bilinguals were found to be handicapped in some aspects of verbal abilities in comparison to their monolingual counterparts (Wang 1926, Smith 1933, 1942, 1957, Chen 1964, Ramsey and Wright 1970), but they were not inferior in non-verbal tests (Yeung 1921, Wang 1926, Ramsey and Wright 1970). The recent studies are more favorable to Chinese bilinguals, however. For example, Kline and Lee (1972) conclude that bilingualism has no detrimental effects on the reading ability of their Chinese-English bilingual subjects. On the contrary, their incidence of dyslexia at the end of Grade Three was much lower than the reported national average. Kuo (1972) is also optimistic in projecting that the English ability of the Chinese bilinguals will reach a level comparable to the norm of their monolingual counterparts after they enter grade school. The contradiction of these test results with the earlier studies undoubtedly points to a need for further study of the problem.

However, the question of the lack of agreement in results between studies in the earlier years of this century and more recent ones may not be due entirely to deficiencies in the methodology in the earlier studies. It is possible that the pattern of acculturation of the immigrant population has changed considerably in fifty years: in the 1920s, immigrants typically entered North American society

as servants and unskilled laborers and lived in ghettos. Today, immigrants may be highly educated people who move immediately into the upper-middle professional classes and associate with their monolingual neighbors on equal terms. We cannot ignore the possibility that such differences in socialization may affect the language acquisition of the immigrant bilingual child.

Bilingualism and Intelligence

The study of bilingualism and intelligence can also be dated back to as early as the turn of the twentieth century. Linguists, psychologists, and educators were at that time concerned about whether bilingualism affects intellectual functioning. Among the early reports, Ronjat (1913) has become a classic in the study of bilingualism (cited in Arsensian 1937, p. 29). Ronjat carefully recorded the linguistic development of his bilingual son, Louis. Louis acquired both French and German simultaneously at home. The father and the relatives on the father's side spoke French to Louis, but the mother and the relatives on the mother's side spoke German to him. These two languages, French and German, were kept on as equal a level as possible. Ronjat reported that from the very start the child pronounced the two languages as well as a monolingual child in either language. At the end of his third year, Louis became

conscious of his bilingualism and eager to show off his bilingual ability by acting as an interpreter. According to Ronjat, Louis' accent and intelligence were not retarded in any way. Even after receiving schooling in French, Louis still maintained his knowledge of and interest in the German language equally with French. Similar biographical reports (e.g. Leopold 1939-49) occur throughout in the literature. However, these studies, valuable as they are, are not empirically sufficient to prove that bilingualism presents no handicap to the intellectual functioning of children brought up in bilingual environments, because it should be noted that children reared in such circumstances were generally rewarded by their family who were unusually eager to see them function bilingually.

Numerous experiments have attempted to determine whether monolingual and bilingual children differ in intelligence as measured by standard tests. The results obtained are unfortunately contradictory. Many investigators, especially in the early years of the century, concluded that bilingualism does have a detrimental effect on intellectual functioning. However, there are others who have found little or no influence of bilingualism on intelligence. But, strikingly surprising are most of the recent empirical studies, which claim to obtain positive test results, suggesting that bilingualism may have favorable intellectual consequences. Part of the

unnecessarily controversial interpretation, i. e., that of racial superiority, possibly arises from confusion of "innate intelligence" and "operational intelligence." If we follow Hebb (1972) to define "innate intelligence" as the hypothetical construct of inborn mentality of an individual, then, by definition, such inborn capacity can not be affected by any external factors such as bilingualism and environmental advantages or disadvantages. Consequently, innate intelligence is virtually beyond any possible empirical measurement. Our concern, therefore, is with the unknown relationship between bilingualism, external factors, and operational intelligence.

Among the early studies which support the deleterious effects of bilingualism, Saer (1923) is a classical and typical example. Saer tested nearly fourteen hundred children of seven to twelve years of age from five rural and two urban districts in Wales. He obtained information about the socioeconomic background, home language, and age of each child, and then administered the Stanford-Binet Scale to his subjects. For those who used Welsh as their mother language, a translated version in Welsh was used instead. The test results revealed (1) that the urban subjects, both bilinguals and monolinguals, outperformed those from the rural area, (2) that there is an inconsiderable difference between monolinguals and bilinguals from the urban district but, (3) that there is a considerable and significant

inferiority of rural bilinguals when compared with their rural monolingual counterparts--the gap of inferiority became wider and wider with each year from seven to eleven years old as shown in rhythm and dextrality tests (p. 38). The mean range of vocabulary of monolinguals was higher than that of the bilinguals. In explaining the discrepancy, Saer speculated that mental confusion possibly occurs in the bilinguals more often than in the monolinguals. Though the Saer study was fairly good in terms of its sample size, it did not carefully control for the factor of socio-economic status which has been repeatedly found to be closely related to measured intelligence and linguistic development (Neff 1938, McCarthy 1954, Jones 1960, Curry 1962).

Several other studies (Graham 1925, Mead 1927, Rigg 1928, Pintner 1932, Jones and Stewart 1951, Lewis 1959) have also shown that the monolinguals outperformed the bilinguals on intelligence tests. Tucker and d'Anglejan (1971, p. 491) sum up the four beliefs widely expressed throughout these studies.

- 1) Children who are instructed bilingually from an early age will suffer cognitive or intellectual retardation in comparison with their monolingually instructed counterparts.
- 2) They will not achieve the same level of content mastery as their monolingually instructed counterparts.
- 3) They will not achieve acceptable native language or target language skills.

- 4) The majority will become anomic individuals without affiliation to either ethnolinguistic contact group.

However, all of these studies could be criticized for failing to control the factors of socio-economic status, age, and bilinguals' knowledge of both languages (cf. Darcy 1953, 1963, Peal and Lambert 1962).

Another group of studies on Spanish-English, Italian-English, and Jewish-English bilinguals (Pintner and Keller 1922, Seidl 1937, Darcy 1946, Johnson 1953, Levinson 1953) and some studies of Chinese-English bilinguals (Yeung 1921, Wang 1926, Ramsey and Wright 1970) show that bilinguals underperformed the monolinguals on verbal tests but scored better or as well as monolinguals on performance of nonverbal tests. In this category, the Seidl study (1937) is a rather well-controlled example (cf. Peal and Lambert 1962). Seidl administered the 1916 Stanford-Binet Scale and the Arthur Point Scale of Performance to his two groups of subjects who were matched on sex and age. The test results revealed that monolinguals were superior to bilinguals on all verbal tests, but bilinguals were superior to monolinguals on performance measures. Although Seidl did control the factors such as age, sex, and bilingual ability, he failed to match the subjects on socio-economic status. It should be noted that the mean occupational level of the monolinguals' parents was in the laboring class while the

bilinguals' was semiskilled labor. This difference in social class may partly explain the superiority of bilinguals on some tests. This criticism could also be applied to other studies (i.e., Pintner and Keller 1922) as well.

Another group of studies (Darsie 1926, Hill 1936, Arsenian 1937, Pintner and Arsenian 1937, Spoerl 1944) showed that no difference was found between monolinguals and bilinguals on intelligence tests. Among them, Arsenian (1937) deserves special attention. Arsenian studied two groups of immigrant children in New York City who had been exposed to a bilingual background from their infancy and were matched on age, sex, socio-economic class, and measurement of bilingualism. Arsenian selected mental tests according to the following criteria.

- 1) The tests should be non-language, in order to eliminate the factor of language ability or understanding.
- 2) The material involved should be of as high a level of symbolic or abstract quality as possible, in view of the fact that most non-language tests are imputed to measure concrete rather than abstract abilities, and it is the latter with which this study is particularly concerned.
- 3) The tests should conform to the usual requirement of validity, reliability, objectivity, and suitability for the particular ages involved in this study (p. 62).

With these criteria in mind, Arsenian administered the Pintner Non-language Test and the Spearman Visual Perception

Test to his subjects. He found out that there was no difference between the two language groups as to intelligence. He concluded that "there was no retardation or acceleration in the mental development of children from age 9 to 14 in the groups studied" (p. 120). His findings were interesting and important. However, Darcy (1953) and Peal and Lambert (1962) criticized the Arsenian study on the grounds that, though it was well-controlled from the point of view of external factors, the tests used were far from acceptable. Two serious flaws were mentioned. First, the Spearman test was not standardized. Second, no verbal tests were administered, and it is not appropriate to exclude verbal tests in an intelligence study, according to these critics. This second criticism produces a dilemma for investigators of the relationship between bilingualism and intelligence.

In summary, the earlier studies may be generally criticized on the ground that the important variables such as socio-economic status, sex, age, degree of bilingualism, and the actual tests chosen, were not carefully controlled. Peal and Lambert (1962, p. 548) conclude the following.

In view of the weaknesses of the studies reviewed the best general conclusion is that there is little evidence to suggest that bilinguals differ from monolinguals on nonverbal intelligence, but that there may be difference in verbal intelligence as measured by intelligence tests. At a certain stage in the learning of the second language, a

bilingual may suffer from a "language handicap."

This conclusion seems to be in line with those studies of Chinese-English bilinguals we have already reviewed in the last section.

The negative relationship between bilingualism and intelligence was challenged by the experimental results reported in Peal and Lambert (1962), who claimed that their group of ten-year-old balanced bilinguals performed at a significantly higher level than their monolingual group on both verbal and non-verbal measures of intelligence. The degree of bilingualism was assessed by the word association test, the Peabody Picture Vocabulary Test, and a subjective self-rating score. Only balanced bilinguals were chosen as subjects. All of these subjects came from schools which were classified as "middle class schools" by the School Commission of Montreal. Peal and Lambert administered the Lavoie-Laurendeau Group Test of General Intelligence, the Raven Progressive Matrices Test, and the Thurstone Primary Mental Abilities Test, as well as various attitude and achievement measures.

Peal and Lambert reported that their findings "run counter to most previous findings in this area and to the original expectation of this study" (p. 558). They found that bilinguals outperformed monolinguals on both verbal and

nonverbal intelligence tests. One important reason for such surprising findings could be due to the nature of the sampling technique, which is a far more important factor that Peal and Lambert originally realized. It should be noted that Peal and Lambert chose only balanced bilinguals as their subjects in the study. Thus, one might suspect that the balanced bilinguals chosen in this study were far more intelligent than common monolinguals, as Peal and Lambert admitted:

... at least some minimum level of intelligence is necessary to become a really balanced bilingual, at least to meet the requirement for bilingualism set in this study.

Furthermore, Peal and Lambert reported that "when the balance measures used did not give a clear indication of whether or not a given child was a bilingual, more weight was attached to his score on the English vocabulary test. Thus some bilinguals who might be balanced, but whose vocabulary in English and French might be small, would be omitted from our sample" (p. 560). It is precisely for this reason that Macnamara criticized the Peal and Lambert study on the ground that it was based on a biased sample of children (1964). In addition, one might question how probable it is that there are many balanced bilinguals in a real bilingual community who are proficient to the same degree in two languages used (cf. Arsenian 1937, p. 19), calling into question the claim that the resulting

generalization can be universally applied.

So long as one is fully aware of all these limitations, the interpretations of the Peal and Lambert study are important. Subsequent experimental studies of balanced bilinguals and evaluation of bilingual programs (Liedke and Nelson 1968, Casserly and Edwards 1973, Lambert and Tucker 1972, 1973, Cumins and Gulutsan 1974) also have tended to support the strong claim made by Peal and Lambert that access to and use of two languages in early childhood might be an asset to cognitive development. This new belief has been put into practice and is best represented by the St. Lambert bilingual education program in Montreal and various bilingual immersion programs across Canada. As Lambert and Tucker (1972) report, the St. Lambert experiments succeeded in demonstrating that the home-school language switch is practically tenable; that is, the children from English-speaking homes can succeed in French schools without suffering deficiency in either English or French language skills.

The above review reveals the conflicting positions held by researchers. It also reflects the pros and cons in the attitudes toward bilingualism among the Chinese parents mentioned in Chapter One. The next section will review the relationship of bilingualism and linguistic proficiency.

Bilingualism and Linguistic Proficiency

One of the most important studies of the relationship of bilingualism to linguistic skills is a doctoral dissertation by Carrow (1957). Carrow attempted to study the effect of bilingualism on linguistic functioning by comparing the English language ability and achievement of two groups of Grade Three children who were matched on age, grade, socio-economic status, and intelligence. The first group was composed of Spanish-English bilinguals and the second of English monolinguals; there were fifty subjects in each group. The Spanish-English bilingual children were chosen by means of information obtained from an interview with the parents. No measurement of the degree of bilingualism was adopted. Carrow administered the California Test of Achievement, Primary Form AA; the Durrell-Sullivan Reading Capacity Test, Primary, Form A, Word Meaning; the Gilmore Oral Reading Test; and the Fairbanks Test of Articulation for Non-readers. She also obtained from each subject a three-minute sample of oral language recorded on tape, as a basis for studying oral language functioning. The test results showed that there were no significant differences between the monolingual and the bilingual children in silent reading vocabulary, silent reading comprehension, oral reading rate, and spelling. However, the monolinguals significantly outperformed the bilinguals in the test of oral reading accuracy, oral reading

comprehension, hearing vocabulary, and arithmetic reasoning. Carrow reasoned that the lower scores of the bilinguals in oral reading accuracy and oral reading comprehension may have been due to the bilinguals who had articulation problems. She attributed the articulation problems to the possible "presence of confused and incorrect language patterns in the home and a meager background of language experiences" (p. 378).

Carrow's logic is supported by Chao's (1972) own experience. In his linguistic biography, Chao observed that his parents spoke an impure Mandarin Chinese of the Changchow dialect which substitutes an abrupt glottal-stop ending for the so-called Entering Tone. Having been exposed to such a speech model, Chao naturally acquired this dialect of Mandarin Chinese. Chao lamented that he had barely managed to correct it in ten long years. Carrow's speculation and Chao's own experience pose a serious question of the desirability of an immigrant's speaking incorrect English with his children at home.

Carrow also observed that bilingual children at all levels of intelligence scored lower in the language achievement tests than monolinguals at corresponding levels, except for the brightest bilinguals of 121 I.Q. and over. The brightest bilinguals either attained or surpassed the achievement of the monolinguals in the same category of

intelligence (cf. Curry 1962). This observation serves to support the criticism Macnamara raised against the Peal and Lambert study, indicating that the subjects in the Peal and Lambert study might have come from a selected elite.

The above brief review of bilingualism and language proficiency shows that the test results are inconclusive. The problem still needs to be explored.

On the Role of an Ethnic Language at Home

It is a widely held notion that an ethnic home language is a handicap for school success and that students with an ethnic home language are bound to experience academic failure in school (Garcia 1974, p. 467). This misconception may have arisen from the earlier I.Q. studies which showed unfavorable test results obtained by bilinguals.

The educational systems in the United States and Canada have, until recently, overwhelmingly discouraged the use of important ethnic languages such as Spanish, Ukrainian, and native Indian languages in school. According to Garcia, as many as 69.8 percent of the public schools surveyed by the United States Commission on Civil Rights, have enforced the "No Spanish" rule on school grounds and in class. Such an enforcement coupled with punishment, Krear (1969) argues,

develops feelings of guilt in Chicanos and tears up emotional roots and the innermost stability of Spanish-English bilinguals (pp. 3-4). She proposes the following.

1) Positive attitudes and practices regarding the use of the mother tongue at school will provide an environment of acceptance for non-native speakers. It will assure him that his language and culture along with his worth as an individual have their place in the host society.

2) Positive attitudes and practices regarding the use of mother tongue at home will provide an atmosphere of security, authentic speech models in English, and a perfect opportunity to attain a high degree of bilingualism (p. 4).

Kreier's criticism that the use of substandard English as the home language for communication "can develop more speakers of English with an accent" was supported by Carrow (1957) and Chao (1972). The concomitant question of the relation of home language to performance on standardized tests was investigated by Spence, Mishra, and Ghozeil (1971).

Spence, Mishra, and Ghozeil administered four standardized tests to 146 six-year-old Mexican-Americans who were matched on age and socio-economic status and were grouped into Group A, who spoke only Spanish at home and Group B, who spoke both Spanish and English at home. The Metropolitan Readiness Test results showed that Group B did not perform significantly better than Group A; in fact,

there were no significant differences between the groups on any subtests or on the total score. However, Group B obtained higher I.Q. scores on verbal tests. Spence, Mishra, and Ghozeil concluded that both Group A and Group B seem equally disadvantaged in terms of their knowledge of English.

Ramirez and Politzer (1975) administered a revised version of the Spanish/American Oral Proficiency Test to forty subjects from kindergarten, first, third, and fifth grades in a bilingual education program. The test results on both English and Spanish versions showed improvement from kindergarten through grades one, three, and five, but only the improvement on the English version was statistically significant. At the kindergarten level there was an obvious imbalance in favor of Spanish, but at the third and fifth grade levels the English and Spanish scores were virtually identical. Ramirez and Politzer found that the significant source of variance in the Spanish test was the language spoken at home, while the significant sources of variance for the English test were grade, language spoken with friends and siblings, and language preferred in school (pp. 118-121). The authors argue that the home language factor determines the achievement on the Spanish version, but the peer group interaction determines achievement on the English test (cf. Kuo 1972, Marckworth 1977b). Ramirez and Politzer contend that their results do not support the well-known

balance effect hypothesis (Macnamara 1966) that one language is achieved at the expense of proficiency in the other. They conclude that the ethnic language used and maintained at home does not affect the children's acquisition of English which naturally "takes place as a result of continued exposure to English in the school environment" (p. 122).

In summary, the use of the ethnic language at home seems to be more desirable than using an incorrect or substandard English, according to the research reviewed, on the grounds that the immigrant children will consequently not develop a kind of English with a foreign accent. It also appears conclusive that the use of English at home does not help the immigrant children in their acquisition of English ; on the contrary, it appears to be deleterious if the home language is substandard English.

Summary and the Need for Further Research

The first section of this chapter reviews the studies of Chinese-English bilinguals. It was shown that the Chinese bilinguals underperformed their monolingual counterparts on reading tests (Chen 1964), vocabulary tests (Smith 1947, Kuo 1972), and tests on proverbs and dissected sentences (Wang 1926). However, they were not inferior in non-verbal tests (Yeung 1921, Wang 1926, Ramsey and Wright 1970).

The second section reviews the relation of bilingualism to intelligence and language proficiency, derived from studies of non-Chinese bilinguals. It was held that there is little evidence to suggest that bilinguals differ from monolinguals on non-verbal intelligence, but that there may be some difference in verbal tests and bilinguals may be behind in language development at a certain stage. This conclusion seems to be in line with that drawn from studies of Chinese bilinguals. In this section earlier studies of bilingualism were criticized for failing to control for external factors such as socio-economic status, age, sex, and degree of bilingualism.

The positive role of the ethnic language was suggested by a number of studies such as Carrow (1957), Krear (1969) Spence, Mishra, and Ghoziel (1971), Kuo (1972), Chao (1972), and Ramirez and Politzer (1975). These studies suggest that the use of ethnic language as the home language for communication does not affect the bilinguals' mastery of a second language.

In addition to the motivations noted in Chapter One for doing the present study, the above review also reveals several other urgent needs for further research. First, since Kuo reported that early school years in fact are the most difficult period for bilingual children and their

parents, it is desperately needed to investigate the language behaviors of Chinese-English bilinguals in this category (Kuo 1972, p. 164) and to scrutinize any possible relationship between linguistic factors and social-cultural variables. Second, many of the previous studies of bilingualism center around vocabulary tests, length of sentence, proverbs, and verbal and non-verbal intelligence tests. These aspects, of course, are interesting questions to investigate; however, some of the most important properties of bilinguals' language and language use such as creativity, acceptability, and communicative competence have not yet received desirable attention. The conceptual bases for doing research along these two lines are discussed in detail in the next chapter.

CHAPTER THREE

METHODOLOGY

An Introduction

This section briefly recapitulates general research questions addressed in this study and introduces various tests administered and factors examined in an attempt to answer these questions. Conceptualization and operationalization of these tests are discussed in detail in the next section.

The principal object of the present investigation as noted in Chapter One, is exploration: exploration and delineation of the linguistic profile of a selected group of upper-middle class Chinese-English immigrant bilingual children, and various social factors which may influence that profile. To investigate these questions, the immigrant bilingual children were given a battery of language tests and the results of these tests were correlated with each

other and with measures on a number of social factors. The language battery was selected to investigate a range of language behaviors and abilities in both the native and the second language. The social factors were ones which were thought might influence the individual's language profile. The following language tests were administered.

1) The Bilingual Syntax Measure-English Version (Burt, Dulay, Hernandez, 1975).

2) A Bilingual Syntax Measure-Chinese Version, developed for this study by the author.

3) A Derivational Morphology Test (Derwing 1976).

4) A Paradigmatic/Syntagmatic Word Association Test-English Version (Bickley, Dinnan, and Jones 1970; Otto 1976).

5) A Paradigmatic/Syntagmatic Word Association Test-Chinese Version, developed for this study by the author.

6) A Code-Switching Test, developed for this study by the author.

The social factors considered were the following.

1) Characteristics of the family neighborhood of residence.

2) Socio-economic status of the family.

3) Parental expectation about the child's schooling.

4) Parental education.

5) Parents' pre-immigration socio-economic status.

6) Frequency of family moving.

- 7) Peer group relationships of the child.
- 8) Influence of media on the child: television, radio, movies, tapes, and records.
- 9) Age.
- 10) Sex.
- 11) Birth order.
- 12) Number of siblings.
- 13) Birthplace.
- 14) English exposure: when the child arrived in North America, when he was put in an English environment consistently and for how long, and how many hours he spent reading English books.
- 15) Family language orientation: how much Chinese or English is used at home.

The Subjects

All of the subjects were chosen according to the following criteria. First, the subject should be age 6 - 12 years and be enrolled in an English-speaking elementary school. Second, the subject should come from a family wherein one of the major Chinese dialects is usually spoken, normally Mandarin Chinese or Taiwanese. Third, the parents should be foreign-born Chinese and, together with their bilingual children who were not necessarily born in North

America, should have stayed in Edmonton, Alberta, for at least one year. Fourth, the families should be of upper-middle class socio-economic status. The last constraint was included because we wished to look at the language patterns of the advantaged immigrant bilingual child; much has been written about the disadvantaged immigrant child, but with the changing patterns of immigration in recent years, it seems important to study this increasingly numerous group.

The subjects chosen according to the above established criteria amounted to twenty-four Chinese-English bilinguals from fifteen Edmonton Mandarin-speaking or Taiwanese-speaking families with an even distribution between the two dialect groups. A detailed description of both communities and their sociolinguistic patterns, and a fuller analysis of characteristics of the subject pool is treated in Chapter Four.

Two groups of adults were also tested on the paradigmatic/syntagmatic word association tests and the code-switching tests to provide base-line data for comparison with that of the bilingual children. The first group consisted of twenty-four Mandarin-speaking and Taiwanese-speaking adults, most of whom were the subjects' parents. The second group consisted of six English-speaking Canadian adults who have studied Chinese at least two years

in the East Asian Program at the University of Alberta.

Test Batteries and Questionnaires

Bilingual Syntax Measure-English Version

Introduction

It has been pointed out in Chapter One (p. 10) that Chinese-born parents are obsessed with the question of whether the bilingual child is able to function adequately in school and in his peer group using the community language; on this basis, we formulate the first general question: how do the bilinguals perform on various English linguistic tests in comparison to monolinguals? This is a legitimate question for research, since if the bilingual child can not communicate as effectively as can the monolingual in the community language, he would more than likely encounter such psychological, emotional, and educational problems as were illustrated in Chapter One. An objective way to evaluate the bilingual child's general linguistic skills is to obtain his scores in standardized tests so that a meaningful comparison between his performance and that of monolinguals can be made. Thus, a widely used linguistic test, the Bilingual Syntax Measure-English Version (hereafter Syntax English) was

considered.

The Bilingual Syntax Measure (both English and Spanish versions) were originally developed by Burt, Dulay and Hernandez (1973, 1975) for measuring children's knowledge of grammatical structures in English and/or Spanish by using natural communication as a basis for making judgements. For instance, in response to a picture of some fish (presumably sleeping) and a question (Q-14), "Why do you think their eyes are closed?" a grammatical response would be, "They are sleeping" or "They are happy," but not "He's sleeping" or "They's sleeping." The test allows children to express their thoughts freely. The recorded response is then analyzed and serves as indicator of structural proficiency. Burt, Dulay, and Hernandez (1975) distinguish five levels of structural proficiency. Level One signifies that "the child neither speaks nor comprehends the language in which the test is administered," whereas Level Five indicates that the child is as proficient as his monolingual English-speaking counterparts. The scores obtained make it possible to compare the over-all grammatical proficiency or the control of specific grammatical structures of any bilingual child with that of his monolingual counterparts, because the Bilingual Syntax Measure-English Version has been widely field tested, and has been administered to as many as 2,200 English-speaking monolinguals.

Recently, investigators adopted the Bilingual Syntax Measure-English Version as a device for both first and second language acquisition research and also for the comparison between them (Dulay and Burt 1973, 1974a, 1974b, Bailey, Madden, and Krashen 1974, Larsen-Freeman 1975). Dulay and Burt (1974a) studied the acquisition sequences of eleven English functors by native Chinese-speaking (presumably Cantonese) and Spanish-speaking children in the United States. The eleven functors regularly elicited from the children are (Dulay and Burt 1974a, p. 41)

Functors

Examples

pronoun case	He doesn't like him.
article	In the fat guy's house.
singular copula	He's fat.
present progressive	He's mopping.
plural	Windows.
singular auxiliary	She's dancing.
past regular	He closed it.
past irregular	He stole it.
long plural	Houses.
possessive	King's.
third person singular	He eats too much.

The children Burt and Dulay studied were six to eight years old and enrolled in American schools where their peers were native speakers of English. Dulay and Burt reported that the same sequence of acquisition of functors for both language groups were obtained. Similar results were also secured in Bailey, Maden, and Krashen (1974) who administered Syntax English to seventy-two adult students learning English as second language. They found that their rank ordering of English functors was highly correlated with Dulay and Burt

(1973).

The administration of Syntax English to the Chinese-English bilinguals in the present study served the following purposes. First, since it had been widely field tested on English speaking monolinguals, it seemed to be a reliable standardized test of grammatical proficiency. When administered, it would indicate the child's strengths and weaknesses in the basic structures of English (Burt, Dulay, and Hernandez 1975, p. 6). Thus, it appeared to be an objective way to evaluate the syntactic aspects of communicative performance of bilinguals as compared with that of monolinguals. Second, since the test was conducted in a natural conversation, of the four linguistic skills, speaking, listening, reading and writing, the former two skills of the bilinguals were also assessed (Burt Dulay, and Hernandez 1975, p. 5). Third, since Syntax English has been adopted as a device for language acquisition research by investigators (Dulay and Burt 1973, 1974a, 174b, Bailey, Maiden, and Krashen 1974, Larsen 1975 and Rosensky 1976), data were available for cross-cultural comparison. Analysis of the test results compared with those obtained from studies of Japanese, Arabic, Persian, and Spanish speakers acquiring English, it was hoped, would yield meaningful advances in our knowledge of language acquisition. For instance, it has been reported in the aforementioned papers that a similar acquisition sequence of English functors by

learners with different native languages was found. It was presumed that the subjects in the present study would conform to these results and acquire the English functors of the test in the same order as other language groups and as English monolinguals.

Materials and Procedure

The Bilingual Syntax Measure-English Version (Burt, Dulay, and Hernandez 1975) used in this study consists of twenty-five questions for testing basically the same grammatical aspects described above except that word order, and conditional perfect are added. Functors and examples are shown in Table 1.

Table 1

English Functors Tested

<u>Functors</u>	<u>Examples</u>
1) word order	Those are birds.
2) pronoun case	She is happy.
3) progressive	He is eating.
4) plural	Her flowers.
5) singular auxiliary	She's dancing.
6) copula	They are wet.
7) article	The fat man.
8) present indicative	He eats too much.
9) past regular	He dropped it.
10) past irregular	He took them off.
11) possessive	His mop.
12) cond. perfect	He would have eaten it.
13) long plural	Houses.

For example, word order is tested throughout the twenty-five questions in Syntax English. Questions such as, "Is the man all wet" and "Are the fish wet?" require answers like "yes, he is" and "Yes, they are" which serve to indicate whether the children have mastered pronoun number. All these questions are embedded in a natural communication setting starting with training questions centering around a culture-free picture book designed especially for the Syntax English by Burt and her colleagues. Based on different pictorial cues, five blocks of questions are used. A question in any block may be used to test more than one functors; for instance, Question 19, "What's the girl doing?" which can be answered by "She's dancing"--clearly, it is a question testing both pronoun and progressive.

The Syntax English test is administered to each subject individually. First of all, the child is put at ease by showing him the pictures and asking the training questions. Then the examiner asks the twenty-five test questions while looking at the appropriate pictures with the child, and the child's responses are written down or tape-recorded. If the child fails to respond to at least three test questions in the first block, the test is discontinued. Otherwise, the examiner proceeds until the twenty five test questions are finished.

Judgments of grammatical correctness are based on the context provided by the questions. Individual children are expected to answer differently to the same questions since they have different backgrounds and perceive the picture differently.

In scoring the test, Syntax Acquisition Index (SAI) is obtained for each subject, following the formula described in the Technical Handbook of the Bilingual Syntax Measure developed by Burt, Dulay, and Hernandez (1976, p. 15). Basically, a plain response word which correctly has no grammatical ending is assigned one point, to which one more point can be added if the response contains a regular grammatical ending, or two more points can be added if the response contains an irregular functor. All the possessive pronouns are weighted for three points. The procedure of

computing an SAI is:

(1) Assign points to the grammatical version of the child's response (Developed Form Value);

(2) Subtract points from this grammatical form to reflect those parts of the child's response that were still developing (Child Response Value); and

(3) Compute a ratio whose numerator is the sum of the Child Response Values for all the items and whose denominator is the sum of all the corresponding Developed Form Values. The Quotient [is] multiplied by 100 to yield the SAI (Burt et al. 1976, p. 15).

The next step is to assign proficiency levels. According to Burt and her colleagues (1976, p. 19), the highest level, Proficient Level, requires a child to have achieved an SAI of at least 95. An Intermediate Level was defined as having acquired an SAI from 85 to 94. The Survival Level ranges from 45 to 84.

In determining proficiency on a specific grammatical structure, are needed, the Expected Scores and the Actual Scores. The Expected score is always two points for each tested item. The Actual Score is assigned by giving two points for supplying a correct structure, one point for a misinformed structure such as, * two childs, and zero point for supplying no structure at all such as, * two child. Finally, a Structure Score is yielded by computing a ratio whose numerator is the sum of the Actual Scores for all occasions when the structure was used and whose denominator

is the expected scores for all such occurrences, multiplied by 100. A structure is said to be acquired if the subject scores 90 or higher for that structure (Brown 1973, Burt et al. 1976, p. 18).

Bilingual Syntax Measure-Chinese Version

Introduction

Motivated by the same conceptualization as Syntax English, the Bilingual Syntax Measure-Chinese Version (hereafter called Syntax Chinese) was developed for this study. The Chinese grammatical functors tested are shown in Table 2, and are discussed below.

Table 2

Chinese Functors Tested

1) word order	wo you shu I have a book
2) measure word (gender)	wo you yi <u>tyau</u> myanbau I have a <u>loaf</u> bread "I have a loaf of bread"
3) progressive	Jang <u>dzai</u> chr lidz <u>ne</u> Jang particle eat pear particle "Jang is eating a pear"
4) stative verb	hwa hen <u>pyaulyang</u> Flower very <u>pretty</u> "Flowers are very pretty"
5) auxiliary	wo <u>hwei</u> lai I will come
6) copula	Li <u>shr</u> yi ge nanhar Li <u>be</u> a measure word boy "Li is a boy"
7) adverb	Wang <u>hen</u> ai hwa Wang <u>very</u> love flower "Wang loves flowers very much"
8) possessive	wenwen <u>de</u> shu Wenwen possessive marker book "Wenwen's books"
9) bei (passive)	fangdz <u>bei</u> ta mai le House by him/her sold particle "The house was sold by him/her"
10) le	Chang dzou <u>le</u> Chang walk particle "Chang walked away"

Surface word order in Chinese is basically SVO and plays a very important role in communication, for example, ren chr ji "man eats chicken" versus ji chr ren "chicken

eats man."

The measure word considered in the present work is Chao's "individual measure" or "classifier," which has also been called the numerative or numerary adjunct (1968, p. 585) and is categorized in structural linguistic terms as gender. In Chinese, a numeral cannot be immediately followed by a noun except in the literary (or classical) language, wenyen. The construction of a noun phrase with a numeral in modern Chinese must be: Numeral + Measure Word + Noun, for instance, yi shu "a tree" (wenyen), and yi ke shu "a tree" (modern Chinese). The measure word is usually predictable according to the shape, kind, or some other property associated with the noun; thus the Chinese character for ke, the measure word for tree, appropriately has "wood" as its radical. Each individual noun is assigned a proper classifier but there is also a general classifier ge which is applicable to all nouns (Chao 1968, p. 588). Since there are several dozen measure words for individual nouns, it may be speculated that it will be difficult for the bilingual child to master all of them. It should be noted that the monolingual Chinese child initially uses ge as the only measure word, and only at a rather advanced developmental level introduces appropriate specific numeratives.

Progressive can be expressed in Chinese in several ways. Sentences (1) through (8) below could all be

translated in English as "I am eating."

- 1) wo chrje ne
I eating particle
- 2) wo jeng chrje ne
I particle eating particle
- 3) wo jengdzai chrje ne
I particle eating particle
- 4) wo jeng chr ne
I particle eat particle
- 5) wo jengdzai chr ne
I particle eat particle
- 6) wo jengdzai chr
I particle eat
- 7) wo dzai chr
I particle eat
- ? 8) wo jeng chr
I particle eat

Sentences (1) - (7) are always acceptable, but (8) can only be used when qualified in some context, for instance, wo jeng chr shr, ta lai le "while I was eating, he came."

The function of noun modifier in the predicate is exhibited by two structures in Chinese: the stative verb, pattern (1) below, and be + Adjective, pattern (2) below. The first pattern is by far the most common, and the use of the second implies intensification or focusing of the adjective. A native speaker of Chinese distinguishes the following two sentences:

- 1) je dwo hwa pyaulyang
 this measure word flower pretty
 "this flower is pretty"
- 2) je dwo hwa shr pyaulang
 this measure word flower be pretty
 "this flower is (really) pretty"

The current study aims to discover whether the child can make a distinction between these two sentences and whether he might take sentence (2) for (1) under a possible influence from English syntax.

The possessive marker is "de" in Chinese, so "yours" is nide "you + possessive particle," and "his" is tade "he + possessive particle." Since the possessive form is marked and attached directly to the stem without exception in Chinese, it may be speculated that it is easier to master than other constructions such as bei and le (explained below).

The passive voice in Chinese is expressed usually by the construction: N + bei + N + V, where bei + N is similar to an English noun phrase, by + Agent, for example,

- 1) syauhar bei mama chufa le
 child by mother punish particle
 "the child was punished by the mother"

Note that, like English, the Chinese passive requires NP

inversion. The bei construction was originally used with disposal verbs such as, buy, sell, and donate, but this restriction was relaxed recently due to influence from English, particularly in such areas as technical literature, for example, jeige wenti bei yanjiu le "This problem has been studied," now is perfectly acceptable. Opportunities were provided in the Syntax Chinese test for the subject to produce or avoid the bei construction with the verb eat, a non-disposal but non-technical verb.

Le is a very important and useful particle whose major functions considered in the current work are as follows. First of all, it has a class meaning of completed action in the past. For instance, Li dzwotyan ku le "Li yesterday cry particle" or "Li cried yesterday," and in the present, for instance, wo hweilai le "I have come back." Second, le used as an inchoative also signifies a new situation or a situation just new to the speaker, for instance, sya sywe le "fall snow particle" could mean either it just began to snow or it has been snowing for some time but the speaker just knows it now.

The choice of functors for the Syntax Chinese test was motivated by several concerns. First, it was necessary to choose structures representative of basic Chinese syntax, which could be expected to be mastered by monolingual Chinese children in the age range of our subjects. Second,

it was felt important that the Syntax Chinese and the Syntax English tests be comparable in the following respects. (1) They should test similar functions (semantic intentions) so that maturational level of the subject would not be a contaminating variable. This condition was largely met; of the Chinese functors, only le has no clear parallel English meaning, and of the English functors, only conditional perfect, and possibly the English article have no clear parallel Chinese meaning. (2) They should be roughly parallel in complexity of structures tested; for example, both tests include an irregular and only partly predictable structure--measure word in Chinese and past irregular in English--and both include regular and non-complex structures--progressive in both languages. Such considerations were presumed to be learnability constraints.

The Syntax Chinese test was administered to the subjects for the following reasons. First, as an exploratory study, it is important to know how Chinese-English bilinguals perform in a Chinese test. Is it true that, for subjects such as ours, the older they are the more slowly their Chinese advances? Second, is it the case that such subjects may have actually lost their mother tongue? If so, how many and what of those early-learned grammatical structures were lost? Are the grammatical structures common to both languages more resistant to loss? Third, is there any correlation between a subject's scores on Syntax English

and Syntax Chinese?

Materials and Procedure

Based on the same rationale and method employed in the Bilingual Syntax Measure-English Version, its counterpart, the Bilingual Syntax Measure-Chinese Version, was constructed to test the specific Chinese grammatical aspects described in the previous section.

Twenty questions in total were presented to the subjects in the same way as in the administration of Syntax English. All the test materials appear in Appendix A. Like its English counterpart, word order is tested throughout the whole test. Grammatical concepts which seem impressionistically to be structurally more complex appear later in the test, allowing subjects to warm up. The answers were evaluated according to the context in which the questions appeared. Scoring methods were based on those developed by Burt and her colleagues (described above), with some modification. A plain response word carrying no grammatical function such as, hwa "flower," is thus worth one point only. For those response words carrying a grammatical function being tested, such as -ie "-ing," one more point was added. The procedure used in computing the SAI and Structure Proficiency in English Version was also adopted to yield the Chinese SAI and Structure scores.

The Derivational Morphology Test

Introduction

One of the most important properties of language is generativity, or creativity from the user's point of view. This notion first appeared in Paul (1891) and Bloomfield (1933), according to Derwing (1973, pp. 308-9, 1976a, pp. 8-9). Chomsky revived and re-emphasized this notion. Basically the argument runs as follows. To learn a language does not mean to learn a set of utterances per se, but primarily to learn a set of productive linguistic rules in a given language, for it is recognized that every child learning English (and possibly second language learners of English, too) is frequently found at a certain stage to say runned or gooses, under the influence of an overgeneralized rule. Therefore, "the fundamental fact that must be faced in any investigation of language and linguistic behavior [is that] a native speaker of a language has the ability to comprehend an immense number of sentences that he has never previously heard and to produce, on the appropriate occasion, novel utterances that are similarly understandable to other native speakers" (Chomsky and Miller 1963, p. 271). To be able to communicate in a language, therefore, can be interpreted as having access to such linguistic knowledge as to allow the formulation and production of an intended message, as suggested in Baker (1976, p. 13). It then

follows that the knowledge of what linguistic rules are available to the language user would yield at least a clue as to the language user's linguistic ability. This notion led to the inclusion of the second test in this study--a test of some English morphological linguistic processes described below.

It is suggested in Berko (1958) that in order to test the productivity of linguistic rules, nonsense forms must be invented and presented to subjects so as to exclude the possibility that the real form has been memorized. Berko's subjects, therefore, were shown a picture of two wugs, but not two dogs to test pluralization, a man zibbing but not patrolling to test present progressive, and a man who ricked yesterday and a man who loodges everyday to test past and third person singular present respectively.

Using the Berko technique, Derwing (1976a) devised a Derivational Morphology Test (hereafter called Derivational Morphology) to investigate six English morphological processes: noun compounding (CPD), as in doghouse; the agentive suffix (AGENT) -er, as in singer; the instrumental suffix (INST) -er, as in eraser; the adjective forming suffix (ADJ) -y, as in furry; the adverb forming suffix (ADV) -ly, as in quietly and an affectionate diminutive suffix (DIM) -ie, as in horsie. In the test, six nonsense stems are used and illustrated. Each nonsense stem is

presented in a dialogue "aimed at forcing the subject to produce a morphologically inflected form of the nonsense stem if the morphological process is available to him" (Marckworth 1977b, p. 7). For example, the subject is shown a picture and the examiner says, "This is a picture of two zabes." To allow the subject practice with the made-up stem and assure he can articulate it, the examiner asks, "What are they?" Next, a picture is shown of a house for the zabes and the examiner says, "This is the house where the zabes live; it's a house for zabes. What do you call a house for zabes? It's a what-kind-of house?" (Marckworth 1977b, pp. 7-8). If the subject has acquired the appropriate noun compounding process, he will produce the new form zabehouse. Derwing administered the test to native speakers of English of three age groups, namely, children (8-12 years old), adolescents (13-17 years old), and adults (18 years old and over). He discovered that the affectionate-diminutive morpheme -ie was never productive (productive was defined as used by or more of the subjects) for any subject group and two processes, the instrumental (INST), -er, and adverbial (ADV) -ly, were not productive in the children's group.

Marckworth (1977a) extended the Derwing test to young children (5-7 years old) in an attempt to determine an onset age of psychological productivity for these morphological processes. Onset time was defined as the point at which at least one subject shows a process as productive; i.e., when

the percent-correct figure is not zero. Her study showed that in the 5-year-old group, only two processes, adjective (ADJ) and adverb (ADV), are pre-onset. She also discovered that none of the processes are productive in the younger children's group "although noun compounding (CPD) was very close." Marckworth (1977b) further extended the Derivational Morphology Test to French-English bilinguals, who were matched with monolinguals on socio-economic status, age and grade level, for comparison with the monolingual young children's group (5 to 7 years old). Marckworth observed that the acquisition pattern of the French-English bilinguals was different from that of the monolinguals. This observation led to her test of a second bilingual group, the Chinese-English bilinguals (ages 5 to 12 years old). In sum, the Marckworth bilingual study (1977b) reveals that

- 1) bilingual children initially lag behind monolinguals in the acquisition of morphological processes,

- 2) monolingual and bilingual children show some different acquisition patterns,

- 3) the young Chinese bilingual children (5-7 years old) lag far behind both the English monolingual and the French-English bilingual groups. (Only CPD shows the equivalent acquisition rate.)

- 4) the older Chinese children (8-12 years old) exhibit, however, "a dramatic catch-up in all but one of the processes."

A close examination of the Marckworth bilingual study

clearly shows that it supports the report of Henderson and Silverman (1973, p.16) who wrote that,

data from the Toronto School Board indicate that young children adapted most readily to the English school programs. For children who entered the school in kindergarten or the early elementary grades, assimilation into the regular program requires about three years. In that time, these students catch up with their English-speaking peers on measures of school achievement ... The older students appear to be less fortunate and take longer to assimilate. Many never catch up with their English-speaking counterparts.

The older Chinese bilingual children in the Marckworth bilingual study entered school in kindergarten or the first grade. The fact that they showed a dramatic catch-up in the morphological test may also suggest that their assimilation into the regular English program is more or less completed (cf. Kuo 1972, Ramirez and Politzer 1975). Since they are the group of eight to twelve year olds, it further suggests that it did take at least three years for them to catch up. In her study of the bilinguals' background, Marckworth found out that family use of Chinese was not a significant variable in the bilinguals' performance on the English morphological test. This finding is in agreement with that of Kuo (1972, p. 122). Kuo shows that the family bilingual scores are positively correlated with the Chinese bilinguals' performance on the Chinese test, but not with that of English (cf. Ramirez and Politzer 1975). These findings indicate, as Marckworth rightly points out, that

the lack of exposure to English at home did not significantly influence the subjects' performance on the English test.

In addition to the conceptual consideration stated in the beginning of this section, a modified form of the Derwing Derivational Morphology Test was used in this study for the following reasons. First, it is interesting to know about the bilingual child's morphological rule acquisition, its rate, pattern, and content, as compared with that of the monolingual child. Such a novel test would provide solid evidence regarding the bilingual's creative use of the second language. Second, it was used in Derwing (1976a, 1976b) and Marckworth (1977a, 1977b) and its utility for testing language acquisition has been confirmed. Third, data from the above studies were available for comparison. Fourth, it was thought of interest to see how the test results in the Derivational Morphology test correlated with those of the Syntax English test; for instance, are they highly correlated or is the reverse true? Though different in methodology, both tests aim at measuring the same sort of productive English linguistic ability. Fifth, does the second language acquisition of derivational morphology precede, follow, or parallel the acquisition of inflectional morphology/syntactic structure? Sixth, a high correlation between these tests would generate a dependable picture of English language development.

Materials and Procedure

The original Derivational Morphology test (Derwing 1976a, 1976b, Marckworth 1977a, 1977b) consisted of fifteen elicitation forms: for each of the six processes tested, a nonsense form and a real regular form, and for three of the processes a real irregular form also. (Responses: zabehouse/doghouse, yurser/singer/cook, cumer/pointer, glurky/muddy, blighly/slowly/fast, oogie/horsie/kitty). The Derivational Morphology test was modified in this study for the following reasons. First, the Derwing test showed that the affectionate diminutive suffix -ie was not productive at all in the role postulated for it. The current study, therefore, ignored it. Second, the irregular forms cook and fast are real English words. Even when they are produced in the test, we are not sure whether the child correctly identifies them as irregular or whether he simply as yet is not producing inflected forms of this category. Thus, a decision was made to drop them from the inventory in favor of nonsense forms. The final modified test consists of five morphological processes, each tested with one real English stem and two nonsense forms, increasing the number of nonsense forms from five to ten. The five morphological processes tested and their corresponding examples are as follows.

- (1) Noun compound: doghouse, zabehouse, oogcatcher.

- (2) Agent: singer, dosher, yurser.
- (3) Instrument: pointer, neaver, cumer.
- (4) Adjective: muddy, teeby, glurky.
- (5) Adverb: slowly, blighly, heesply.

The items were randomized and presented to the subjects who were tested individually, either at home or at school in a quiet corner. Following the technique described above, the experimenter went through the set of pictures and dialogues with the subject to elicit responses to the tested stems. Responses were scored as correct (expected) yielding one point or error (not expected) and null (no response) with no credit given. The error responses were also recorded so that a comparison of the error patterns of bilingual children and those of their monolingual counterparts could be made. In the final scoring, only nonsense forms were used in the primary analysis and the real regular forms were looked at only in a subsidiary analysis.

The Paradigmatic/Syntagmatic Word Association Tests

Introduction

The second general question delineated in Chapter One (p. 10) motivated the use of the third sets of tests in this study: a pair of paradigmatic/syntagmatic word association

tests (hereafter Word Association Test). The questions are: what appears to be the effect on a child's language behavior due to access to two competing language systems; i.e., is there any effect, and if there is, what is the nature of this effect? Is it an enhancing or an interfering one? Will it, given this particular sample, support Macnamara's "balance-effect" hypothesis which predicts that "if a child develops skills in one of his two languages, he generally pays for it by a deficit in the other" (1966, p. vi). These questions entail a comparison of the bilingual's English and Chinese scores on a common test. Thus, both an English version (Bickley, Dinnan, and Jones 1970, Otto 1976) and a Chinese version prepared by the author of the Word Association Tests were administered.

Before going further, it is useful to define some terms first. In a typical paradigmatic/syntagmatic word association test, the experimenter says a word, for instance, new, then the subject is required to utter the response that comes to the mind first, for example, old. If a response can substitute for its stimulus in a sentence, these two elements are said to be in a paradigmatic relationship. For instance, as demonstrated in Taylor (1976, p. 67),

my	new	car
the	old	book
his	big	pen
that	ugly	bag

the noun phrase my new car consists of three elements. Any of the elements listed in the same column could substitute for them to make another equally acceptable phrase, such as the old bag. Bag therefore, stands in a paradigmatic relation with car, pen and book. The paradigmatic words are usually of the same form class (Bickley, Bickley, and Cowart 1971, p. 11) and illustrate one of the following relationships:

- a) Superordinate: stimulus: apple
 response: fruit
- b) Co-ordinate: stimulus: arm
 response: leg
- c) Contrast: stimulus: black
 response: white
- d) Whole-part: stimulus: branch
 response: tree

A rhymed response to a stimulus, such as pin/bin or long/fong is defined as a "clang response." Any response to a stimulus in a word association task which is not paradigmatic or clang is classified as syntagmatic, such as red/pencil or bad/man. In almost every case of a syntagmatic response, the stimulus/response pair makes up a syntactic constituent.

That the word associations of children differ systematically from those of adults has been known since the classic experiment of Woodrow and Lowell (1916) who found that children would easily follow a stimulus word in ordinary language with a syntagmatic response, for instance,

deep/hole, soft/pillow, table/eat, and man/work. The responses of adults, however, were soft/hard, table/chair, man/woman, and deep/shallow. It should be noted that the adult's responses and stimuli seem to come from the same grammatical class, that is, table and chair, man and woman, are nouns, and deep/shallow, soft/hard are usually adjectives. Ervin (1961) obtained free word associations from children in kindergarten, Grade Three, and Grade Six. She found that the proportion of paradigmatic responses increased with age and was accompanied by a decline in syntagmatic responses. Similar findings were also reported in Brown and Berko (1960). How do paradigmatic responses develop? Brown and Berko (1960) hypothesized that

as utilization of syntax develops in children, syntactic similarity in words becomes an increasing determinant of word association and that the development trend from Heterogeneous (Syntagmatic) responses toward Homogeneous (Paradigmatic) responses is a manifestation of this great step forward into syntactic operations (p. 4).

Adopting the concept of semantic markers (Katz and Fodor 1963), McNeill (1966) contended that young children give relatively few paradigmatic responses because they have not yet mastered the complete lists of semantic markers. For example, man has semantic markers, (living), (human), (adult), and (male). A common paradigmatic response forms a minimal contrast with the stimulus--a shift in one semantic marker causes the change of meaning. So when the stimulus is

man, woman is often given as a response. Both man and woman are (living), (human), (adult) but differ only on one semantic marker (sex). Man and woman also share such syntactic features as (noun, count noun, singular) (Taylor 1976, pp. 68-69). This explanation is not completely satisfactory, however. It does not explain why the responses are the kinds of word that follow the stimuli in speech (cf. Lippman 1971, p. 397, Taylor 1976, p. 69). For example, there are many responses that could be given to the stimulus man and fit the criteria of semantic marker, i.e., police or boy. McNeill's notion seems better at explaining the finding that children's responses are often in grammatical classes different from stimuli.

The Paradigmatic/Syntagmatic Word Association Test has also been found to be highly correlated with reading readiness. Bickley, Dinnan, and Jones (1970) administered it to fifty-two first grade public school pupils. The subjects also took the Metropolitan Readiness Test. Bickley, Dinnan, and Jones reported that subjects of low readiness gave more syntagmatic responses. The same result was also obtained by Otto (1976). A high proportion of syntagmatic responses was also found to be closely correlated with a poor verbal ability score on the Scholastic Aptitude Test by Dinnan, Bickley, and Williams (1970).

In concluding their review of paradigmatic/syntagmatic

responses, Glucksberg and Danks (1975, p. 60) wrote that, "the amount of evidence on this point is equivocal with regard to whether the paradigmatic-syntagmatic change reflects a shift in ways of thinking, or a deeper mastery of the language." The administration and construction of both the Word Association Test-English and the Word Association Test-Chinese to bilinguals should reveal whether it is a shift in ways of thinking or a deeper mastery of the language. For instance, if a bilingual child consistently scores better on all English tests and gives more paradigmatic responses in the Word Association Test-English but comes up with more syntagmatic responses in the Word Association Test-Chinese, then we may conclude that the paradigmatic/syntagmatic shift reflects a deeper mastery of the language and does not reflect general cognitive maturity.

The present study constructed and administered both Chinese and English versions of the Word Association Test to the Chinese-English bilingual children for the following reasons. First, the Word Association Test-English not only provided an index of the English reading ability of the bilinguals but also of their language maturity. Thus, the test results would resolve the conflicting findings of Chen (1965) and Kline and Lee (1972) concerning the reading ability of Chinese-English bilinguals. Second, the Word Association Test-Chinese showed the bilingual's Chinese

ability. Third, the Chinese-English adults also took the Word Association Test-Chinese but not the Word Association Test-English, so that the baseline of the Chinese language maturity score could be established. This insured that a standard of comparison for the bilingual's Chinese ability was available for making comparison with his English ability. Fourth, the administration of both Word Association Test versions would enable us to see whether they measure language maturity in a specific language or general cognitive maturity. Fifth, one measure of bilingualism might be obtained.

Materials and Procedure

The Word-Association English task consisted of twenty nouns adopted from the Bickley, Dinnan, and Jones (1970) study, and the Otto (1976) study. A Chinese version was devised for this study comprised of twenty nouns as well, but different from those of the English version. The stimuli in the English task are:

- (1) front (2) king (3) life (4) work
- (5) father (6) city (7) war (8) morning
- (9) milk (10) table (11) house
- (12) apple (13) foot (14) south
- (15) water (16) sand (17) needle
- (18) sugar (19) doctor (20) wife

The stimuli in the Chinese task are:

- (1) jr (paper) (2) shou (hand)
- (3) dzwobyan (left hand side)
- (4) fan (cooked rice) (5) chyou (ball)
- (6) chedze (car) (7) hwa (flower)
- (8) syauhwar (joke) (9) sye (shoes)
- (10) byau (watch) (11) yifu (clothes)
- (12) dyanhwa (telephone)
- (13) didi (younger brother)
- (14) ditan (rug) (15) dyanshr (television)
- (16) chuang (bed) (17) men (door)
- (18) bingsyang (refrigerator)
- (19) tang (candy) (20) yu (fish)

Subjects were individually administered both the English and Chinese versions and were instructed to tell the examiner the first word they thought of each time the examiner said a word. Subjects were informed that there were no right or wrong responses. In addition, the Chinese version was administered to three groups of bilingual adults; twelve Mandarin Chinese-English bilinguals, twelve Taiwanese-English bilinguals, and six English-speaking Canadian adults who have studied Chinese at least two years in the East Asian Studies Program at the University of Alberta.

The word associations were independently categorized into either paradigmatic or syntagmatic responses by three scorers. Differences were discussed and agreement was reached. Only paradigmatic responses were scored, yielding one point for each paradigmatic response, up to twenty possible points.

The Code-Switching Test

Introduction

The notion that language is an instrument for communication rather than a formal object to be described for its own sake has been recognized by various researchers recently (Prideaux 1975, Baker 1976, Yngve 1969, 1975, Morgan 1973). Yngve (1975) even redefined the study of language as human linguistics, whose goal is to achieve a scientific understanding of how people communicate, for it is acknowledged that "it is only in the context of the communicative situation that the essential properties of a linguistic system can be discovered and analyzed" (Baker 1976, p.2). This notion has long been put into practice in observing bilinguals in communication. Code-switching, which is an interplay of two languages in utterances, is a fairly common communication phenomenon with bilinguals. It is characterized by frequent switching from one language to the

other in a natural conversation. Non-linguistic variables have been proposed to explain why bilinguals switch languages. It is observed that different languages are relevant and appropriate in different contexts. For example, Gumperz and Hernandez-Chavez (1972, p.98) demonstrate that switching code "is a response to each discussant's assessment of the others' ethnic identity, age, sex, degree of solidarity or confidentiality." When the topic of conversation turns to aspects of the other culture and life, a language switch is made. This type of language switching can be made inter-sententially or intra-sententially. The ability to switch codes effectively is recognized, therefore, in many bilingual speech communities as an ability to be cultivated, and it identifies the speaker as a member of the bilingual rather than the monolingual community. This phenomenon not only is observable among adult bilinguals but also among bilingual children. The following example is an interesting one (personal observation).

Child: ma, gwak be ai / juice. "Mother, I want juice." (Taiwanese-English code-switching).

Mother: juice / keng di / bing-syang. "Juice is in the refrigerator." (English-Taiwanese-Mandarin code-switching).

Child: bing-syung, / not / bing-syang. "You should say bing-syung, not bing-syang." (Taiwanese-English-Mandarin code-switching.)

The child was taught in Taiwanese only and did not know Mandarin at all, so he regards bing-syang (Mandarin pronunciation) as an unacceptable pronunciation of the Taiwanese vocabulary item for "refrigerator." This casual observation of mother-child communication leads to the belief that a Code-Switching test might be a viable way to examine the child's bilingual language ability.

Various researchers (Hasselmo 1970, Blom and Gumperz 1972, Lance 1975, Gumperz and Hernandez-Chavez 1975, Timm 1975, and Wentz 1977) have suggested that bilinguals switch code according to some universal and psychologically real principles. In examining samples of bilingual talk and taped conversation by Mexican-Americans residing in California, Timm (1975) noticed that there are syntactic limits to switching. Timm argued that various surface-structure constraints on Spanish-English switching may help preserve grammaticality and acceptability in each language (p. 477). Sentences which violate these surface-structure constraints are judged unacceptable. These constraints are:

1) against switching between pronominal subjects or objects (direct or indirect) and the finite verbs to which they belong

*yo went

"I went"

*I fui

"I went"

2) against switching between finite verbs and their infinitive complements

*They want a venir

"(They) want to come"

*voy to decide "(I'm) going to decide"

3) against switching between auxiliaries and main verbs

*I must esperar "I must wait"

* He has visto "He has seen"

4) against switching between a negative element and the verb negated

*I don't quiero "I don't want"

5) limited switching in NPs containing a determiner and an adjective

*Su favorito spot "His favorite spot"

In the present study, a Code-Switching test was devised and administered to above-mentioned three groups of bilingual adults whose native languages are Mandarin Chinese, Taiwanese, and English as well as to the primary subject group, the bilingual children. A sample of test items appears in the next section. The purposes of this switching test were as follows. First, to test the universality of the surface-structure constraints such as those stated in Timm (1975). Second, to examine the relationship between the bilinguals' Word Association Test-Chinese scores, the Syntax Chinese scores and the Code-Switching test, with the hope that a dependable Chinese ability measure for bilinguals of the sort in our subject pool could thus be yielded. Third, to discover the relationship between scores on the Derivational Morphology, the Syntax English and the Code-Switching test. Fourth, as explained in the preceeding paragraph, the ability to switch

codes effectively could be considered as an identification of the speaker as a member of the bilingual community; consequently, the Code-Switching test may serve as an indicator of the bilingualism achieved by the subjects.

Materials and Procedure

The Code-Switching task was designed for this study. It consisted of twenty-five sentences, five of which were assigned to each of the five surface-structure conditions stated in Timm (1975) and illustrated in the above section. Each surface-structure condition is, therefore, tested by a block of five sentences. At least two sentences in a block are restricted to strictly syntactic testing, and contravened Timm's constraints; that is, each stimulus was predicted to sound "wrong" to a fluent code-switcher. Cultural or language specific factors were introduced into the remaining three stimuli. Such arrangement is witnessed by the following block of sentences which were constructed to test the surface-structure condition against switching between pronominal subjects and the finite verbs.

- | | |
|----------------------|--------------------------|
| (1) you / chrfañ | "you eat" |
| (2) ni / go | "you go" |
| (3) Richard / chrfañ | "Richard eats" |
| (4) gege / go | "The older brother goes" |
| (5) Jang shan / go | "John Doe goes" |

The first and second sentences were designed to test whether switching between pronominal subjects and the finite verbs is acceptable or not. The remaining three sentences contain subjects such as, Richard, gege "the older brother," and Jang Shan "John Doe," which can be termed language-specific or culture-specific items. (Richard is an English name. Older brother has an important cultural role in the Chinese family structure. Jang Shan fills the same role in Chinese that John Doe does in English.) Then, you / chrfan "you eat" is tested against Richard / chrfan "Richard eats," to explore experimentally how subjects react to these switchings.

The stimuli then were divided into two parts, with part one comprised of eleven sentences switching from English to Chinese and part two consisting of fourteen sentences switching from Chinese to English. The sentences in each part finally were randomized and presented to the subjects individually who were then asked to grade the sentences according to a scale of acceptability ranging from good, all right, funny, to very funny. All twenty-five stimuli in the Code-Switching test appear in Appendix C.

The score for each sentence ranges from four points for the judgement of the sentence as very funny, one point for good, and zero for no reply. The prediction was that the sentences which contravene Timm's rule would be judged much

funnier than those which contravene cultural constraints only. A standardized score was computed for each child by adding up all of his points obtained and divided by the mean of the total scores of the Chinese adults.

Questionnaires on the Sociolinguistic Background

A Brief Description of Conceptual Framework

It is a truism in sociolinguistics that social factors are highly correlated with child language development. "It is the social environment that operates to stimulate or to retard a child in his language development" (Kuo 1972, p. 49). According to Kuo this process is called "language socialization" and is the focal concern of the symbolic interactional approach in sociology. The symbolic interactional approach has the following interesting assumptions. First, "man has the capacity to learn huge numbers of meanings and values through symbolic communication. He learns these by interacting with other persons" (Rose 1962, p. 9). Second, "one learns nearly all symbols through interaction with other people, specifically members of the family" (Schvaneveldt 1966, p. 109). These assumptions are of special interest to this study. First of all, they imply that symbols, language included, are for communication, especially communicating messages and values

to other people. This is a position essentially no different from that taken by various researchers in linguistics (Prideaux 1975, Baker 1976, Yngve 1969, 1975, Morgan 1973), and adopted as a conceptual framework in this study. Second, the learning of symbols, language included, is not only psychological but also sociological. A study of the acquisition of language by children reared in an atypical environment, such as that of the bilingual subjects in the study reported in this dissertation consequently has to look at external factors in order to account their possible influence upon measures of language ability and behavior.

Sociolinguistic Factors

Introduction and Procedure

The sociolinguistic features of the primary subject group explored in the current work were briefly mentioned in an earlier section of this chapter. They are listed here in the order in which they will be discussed below.

- 1) Parents' pre-immigration socio-economic status.
- 2) Socio-economic status of the family.
- 3) Age.
- 4) Parental expectation about the

child's schooling.

5) Parental education.

6) Peer group relationships of the child.

7) Characteristics of the family neighborhood of residence.

8) Frequency of family moving.

9) Family language orientation: how much Chinese or English is being used at home.

10) English exposure: when the child arrived in North America, when he was put in an English environment consistently and for how long, and how many hours he spent reading English books.

11) Influence of media on the child: such as television, radio, movies, tapes, and records.

12) Birth order.

13) Number of siblings.

14) Birthplace.

15) Sex.

To investigate these factors which might influence the bilinguals' linguistic performance, the Questionnaires on the Family Bilingual Pattern and the General Family Background and Interview Guide used by Kuo (1972, pp. 180-193) were adopted and modified into a Questionnaire on Sociolinguistic Background and used for this study. It will be found in Appendix D. Sixty questions were included in the questionnaire, and the parents were asked to answer these

questions. The following section will describe the relevance to this study of the aforementioned factors, their operationalized forms, and the method of quantification of some of them, where necessary, for statistical analysis.

One of the most important social factors considered in the current work is social class. The difference in language use between children from different social environments was an object of extensive investigation during the sixties. Theoretical inspiration came from Basil Bernstein's writings in England. Bernstein (1971) distinguished a restricted language code and an elaborated language code. The restricted code is "characterized by a low syntactic and lexical diversity, and by the implicit, particularistic, and concrete features of the meanings that are transferred" (Geest, Gerstel, Appel, and Tervoort 1973, pp. 24-25). The elaborated code, on the other hand, is characterized by a great number of syntactic and lexical possibilities suited to carry abstract and explicit meanings. Members of the middle class have access to both codes, but those who come from the lower class have access to the restricted code only. Why do members of the lower class have access to restricted code only? Bereiter and Engelmann (1966) argued that the children from lower class lag behind those from the middle class in language development because of environmental deficiencies, and that these children experience far less verbal interaction with their mothers at

an early age, and thus even are behind in cognitive development. Such an explanation is not totally satisfactory, and Bernstein (1971) held that the language capacity of children from the lower class is equal to that of those from the middle class, but children from the lower class put it to use in a different way.

McCarthy (1954) also reported that "there is considerable evidence in the literature to indicate that there exists a marked relationship between socio-economic status of the family and the child's linguistic development" (p. 586). McCarthy quoted a study by Descoeudres (1921) in which children of the upper class were shown to outperform those of the lower class on practically every item of an extensive battery of tests that involved language. Such evidence abounds in the literature (cf. Jones 1960, Curry 1962).

To quantify socioeconomic status, Pineo and Porter's Canadian National Occupational Prestige Scores (1970) was used. Pineo and Porter's study was the first national study of occupational prestige for Canada. For deriving the prestige scores, they required all respondents to rank 204 occupational titles. They obtained a national sample of 793 cases and the scores they computed were found to be highly correlated (.91) with those found by Duncan (1962) in the United States. According to Pineo and Porter, professional

occupations ranked highly, particularly university professor, physician, and court judge.

Since many studies are available on the language behavior of the lower class, ghetto-dwelling, immigrant child (McCarthy 1954, Jones 1960, Curry 1962), this study chose to investigate children from an upper-middle class, highly education-oriented, immigrant group. It was thought that if the bilingual children perform in English tests more like monolinguals than do the children from lower social strata, it would seem that many of the problems with the language of children from lower SES must stem from social factors rather than from factors engendered by having and using two language systems.

Age and schooling are important factors to examine as likely influences on language behavior. Language development has been generally found to be closely related to maturational stages. For instance, two of the morphological processes, instrumental and adverbial formation, investigated in Derwing (1976b) were not yet productive in the 8-12 year old children's group but were productive in the 13-17 year old adolescents. Furthermore, the literature reviewed in Chapter Two seems, in particular, to suggest that at a certain chronological stage bilinguals lag behind monolinguals in English language development, but catch up at a later stage (cf. Marckworth 1977b, Kuo 1972, and

Arsenian 1937). Without taking these factors into account, we may miss important influences on the bilingual child's development. Since schooling for almost all children is predictable from age, it is not possible to separate the influence of these two factors.

Parental influence has been found to be highly correlated to the educational aspirations and occupational mobility of high school boys in the United States (Kahl 1953, Floud 1956, Bordna 1960, Sewell and Shah 1968). Sewell and Shah found that parental encouragement seems to be a powerful source in encouraging high educational aspiration in high-school seniors who are from low SES but are high in ability. "In general, however, parental encouragement appears to have its strong effect on college plans of males and females who score relatively high on intelligence and come from families occupying relatively high socioeconomic positions" (Sewell and Shah 1968, p. 571). When parental encouragement is low, few students, regardless of their I.Q. and SES, have high educational aspirations. By the same token, it was reasoned that parental encouragement must have its influence on the bilingual's linguistic development.

Parental influence on the bilingual's linguistic development can be measured by questions such as "How important do you think it is that your children should be able to speak the Chinese (English) language fluently?" "How

important do you think education is?" The answer is a scale ranged from really important, important, helpful, to enjoyable.

Peer group influence and neighborhood are also important factors to consider in the study of bilingualism. Gulutsan (1974) reported the following case.

John was encouraged by his parents to continue his French. Two of his best friends took Industrial Arts and had a good time.... The difficult weeks began and John hated French more than ever.... He made up his mind that next year he would join his friends in the fun-class and say good-bye to French. But later in the Fall.... the family moved and John had to change school.... In this school, John did not feel he was missing anything during French class because everyone studied French.... John observed also that parents of his new friends often spoke a second language.... In a short time John's mother noticed that the problem "of having to take French" was a thing of the past (p. 160, emphasis added).

This case reflects the powerful influence of the peer group and neighborhood. It may be speculated that the amount and nature of the contact with peers will affect the bilingual's English scores, with greater contact-time and a more homogeneous monolingual English peer group correlating with higher English scores. This variable may be tapped by asking "Who are your child's three best friends?" and "How often do they play together in a week?"

Family linguistic orientation is a complex factor designed especially to estimate the relative amount of Chinese and English used by the family members among themselves in the home. As stated in Chapter Two, it was suggested that the use of ethnic language as the home language for communication does not affect the bilingual's mastery of a second language (Kuo 1972, Ramirez and Politzer 1975). Marckworth (1977b) also found that "lack of exposure to English in a very important component of the child's life did not significantly influence his performance on the test materials" (p. 19). It will be useful if further testing can be done and results analyzed to explain why this is so. An attempt to do this was made by decomposing this complex factor into five sub-factors.

- 1) Father-child: the language used by the father to the child
- 2) Mother-child: the language used by the mother to the child
- 3) Child-father: the language used by the child to the father
- 4) Child-mother: the language used by the child to the mother
- 5) Bilingual Exposure Scores (BES): the language used and Chineseness maintained by the parents.

It should be noted that this decomposition characterizes Bilingual Exposure Scores as a particularized measure of the

child's passive exposure to the home language, as opposed to the active use and exposure for the other four factors.

The five factors listed above are tested by questions, originally formulated by Hoffman (1934), modified by Kuo (1972), and adopted in this study, about who speaks what language to whom how often in the home. Each question may be answered with "never," "sometimes," "often," "mostly," and "always," which were then scored 0, 1, 2, 3, 4 points respectively. Scoring yields a percentage figure for the amount of Chinese language used and Chinese culture maintained by the subject's parents in the home.

The factor, English Exposure, covers four sub-factors:

- 1) North American arrival age: how old was the child when he first arrived in North America.
- 2) English environment age: how old was the child when he was put consistently in an English environment.
- 3) English environment years: how many years has the child been in an English environment consistently.
- 4) English reading hours: how many hours does the child spend reading English books weekly.

The factor, Influence of Media, investigates the child's exposure to television, radio, movies, tapes, and records. Both Influence of Media and English Exposure were designed

to find out which experiential or environmental factor other than age may account for the variance, if any, in the test scores. It is also interesting to know which factor may predict specific test scores. Through a close observation of how these factors interact with test scores, we may determine whether such external factors as these influence how immigrant bilingual children learn, or fail to learn, the second language, and whether they maintain, or fail to maintain, the first.

Other factors such as, Birth Order, Number of Siblings, Birthplace, and Sex need little comment. In regard to Birth Order, it has been suggested that the second-born child usually is less proficient in the ethnic language because when he is learning a language his older sibling has attended English school already and certainly would bring English home and communicate in English with the younger one (Kuo 1972). The factor, Number of Siblings, investigates the hypothesis that the presence or absence of other children in the home may influence the amount of English versus Chinese the subjects hears, and the amount of adult versus child communication. Birthplace examines the question of whether the language patterns of the foreign-born child differed from those of the Canadian-born. Sex reviews the consistent reports in the literature on higher verbal ability in females than in males of comparable age in the elementary school years. To further explore these factors and their

possible relationships with both Chinese and English language tests was thought to be of interest.

Research Questions

The specific research questions tested in the present work were thus as follows.

- 1) Do the bilingual children lag behind the monolinguals in general?
- 2) Is age an important variable? Does the 9 - 12 age group approximate its monolingual counterpart in performance?
- 3) Is the acquisition order of English functors similar to results obtained by other investigators?
- 4) Are the bilinguals' scores in the Derivational Morphology test highly correlated with those in Syntax English?
- 5) Is the family use of Chinese a significant variable in the English tests?
- 6) Is parental expectation related to all performance scores?
- 7) Does family bilingual orientation influence the bilinguals' Chinese scores? Is it the case that the more the family is Chinese language oriented, the better the Chinese scores, but not the English scores?
- 8) Are the bilinguals' Word Association-English scores highly correlated with Derivational Morphology and Syntax English?
- 9) Do paradigmatic responses increase with age in both Chinese and English versions of the Word Association tests?

10) Is it the case that the more paradigmatic responses, the better the Code-Switching scores?

11) Is it the case that the higher the English exposure scores, the higher the Derivational Morphology and the Syntax English scores?

The results and analyses bearing on these questions will be presented and discussed in the following chapter.

CHAPTER FOUR

RESULTS AND DISCUSSION

Sociolinguistic Pattern

Profile of the Subject Pool

Following is the general description of the subjects' social environment based on the questionnaire and in-depth interviews. All of the twenty-four subjects in the current work come from fifteen families of upper-middle class background living in exclusively English-speaking Edmonton neighborhoods, where their best friends and playmates were, without exception, English-speaking monolinguals. In every case, the primary family wage-earner is the father, and the fathers' average Occupational Prestige Score is 73.95. This is fairly close to the national mean score of 72.4 for professionals according to the socio-economic categories of

Pineo and Porter (1970). Eleven of the fathers hold the doctorate and the rest a master's degree from North American universities. The pre-immigration status of the parents was that of students in Taiwan. All but one of the families have lived in their present community for at least five years; the one family came from Taiwan just one year ago.

These Taiwanese-speaking and Mandarin-speaking parents, now in their late 30s and early 40s, came from Taiwan where, like Japan, competition for educational opportunity is dreadfully severe, and they naturally are highly education-oriented. Though they would not put as much pressure on their children as their parents once did on them in childhood, when asked about the importance of education or of learning English, they unequivocally placed the highest rating on these activities, only adding so long as it would not harm the child's normal development. As for the importance of their children's learning of Chinese, fifty-percent of them responded by saying either "enjoyable" or "helpful" whereas another fifty percent said "important." These parents hope that their children will maintain the Chinese cultural traditions, even as they, at the same time, hope for their smooth and successful acculturation to the North American community.

This community of parents can be characterized as in favor of bilingualism, which however, they feel is more

difficult to achieve than bi-culturalism. A substantial percentage of the parents, ninety-two percent, expressed the belief that bilingual experience may have a positive influence on the child's intellectual development, while only eight percent of them were worried that bilingualism may be a burden to the child. Among those who believe in bilingualism, every effort is made to persuade their children that the learning of Chinese can be useful. A parent reported that,

We took X to a Chinese restaurant, and ordered four dishes, with two of them from the Chinese menu and the other from English menu. When X enjoyed very much the authentic Chinese dishes ordered from the menu written in Chinese characters, we began to instruct him how useful learning of Chinese can be (case #7).

Other optimistic parents (cases #4, #16) asserted that the children spend thirty-five to forty hours a week in the English school learning English from English-speaking teachers and friends, almost as much time as they stay at home, and they also have easy access to various overwhelming media events in English in the home. Consequently, it is the children's Chinese that these parents are worried about rather than their English. The influence of the media, especially television, can not be overestimated. A mother (case #4) insightfully remarked that TV is extremely influential for children who are young and who do not know much English. These young children follow closely and

imitate honestly what is offered on TV, although the older children are more interested in the content of the TV program, and not so much in linguistic aspects, except for jokes. Similar views were also expressed by other parents (cases #10, #12, #20). The majority of these parents are so education-oriented that they themselves would not watch what they consider to be inappropriate TV programs, not to mention movies, in order to serve as a good model for their children.

In the homes in our sample, Chinese is the language of choice for the parents. Linguistically speaking, these parents are fully aware of the fact that they are not native speakers of English; therefore, they consider themselves as a good model for their children's learning of Chinese but not of English. Consequently, in only two homes are English stories read to the children in bedtime; however, in actual communication, no parent hesitates to use fragments of English such as vocabulary or idioms in Chinese sentences.

One of the most predominant sociolinguistic patterns derived from this study, though not a strikingly surprising one, is that nearly half of the subjects (forty-six percent) responded to their parents in English while their parents address them in Chinese, and they communicate perfectly well in this way. It is misleading, however, to characterize all of the children as receptive bilinguals (according to

Macnamara, persons who can understand the language but can not speak it.) Sixteen percent of the subjects totally failed to respond in the the Syntax Chinese test while another twenty-five percent could barely communicate in fragmentary Chinese. Almost all of the children tested (ninety-two percent) communicate exclusively in English with their peers, Chinese or Canadian alike, and invariably utilize English when cursing and self-talking. When being asked to give reasons for such a fact, a parent (case #3) commented that since swearing is not heard at home, the child learned it in English from peers and certainly would say it in English. She felt that for one thing, the child reasoned that the parents did not know any Chinese swearing not to speak of any in English, so it was safe to use it as an emotional outlet. On the other hand, the western-educated parents hold that, unless the child has really gone too far, tolerance may be in order occasionally, and mild disapproval may be expressed in a more subtle way such as pretending to know nothing at all about such usages in English.

Table 3 gives some information about the individual subjects. Note that over half were born abroad, and the average years of English exposure is 3.8 years. Eleven of the subjects are female and thirteen are male. Seven are in the 6-7 year-old range, six in the 8-9 year-old range, five are 10 years old, and six are 11-12 years old.

Table 3

Subject Profiles

Subject No.	Sex	Age	Born Abroad	English Exposure (years)
1	m	12	yes	6
2	f	12	yes	6
3	f	12	yes	6
4	f	12	yes	6
5	m	11	yes	6
6	m	11	yes	5
7	m	10	no	4
8	f	10	yes	4
9	f	10	no	7
10	m	10	no	5
11	m	10	yes	4
12	m	9	no	3
13	f	9	yes	5
14	m	8	yes	3
15	m	8	no	4
16	m	8	no	3
17	m	8	yes	1
18	m	7	no	5
19	f	7	no	2
20	m	7	no	2
21	f	7	yes	2
22	f	6	yes	1
23	f	6	no	1
24	f	6	no	1

The bilingual language development pattern of the eighteen subjects in the current work who were born in Canada or immigrated before school age can be characterized as follows. Typically, at the babbling stage, the child was exposed only to Chinese with very little English except vocabulary items such as "hamburger." Roughly by the time the child turned three, he began receptive exposure to English via TV programs such as Sesame Street, and mimicking

basic English expressions after the characters on TV by murmuring, for instance, "up and down" and "in and out." Radio, movies, and records were not attractive to the child and hence were not as influential as in the pre-TV era. Then, between the age of three to five, awareness of the existence of two languages emerged, when wider contact with the outside world, chiefly with peers and neighbors, was made. In this stage, the child learned English mainly from TV and occasionally neighbors. The frequency of the use of English started to rise as he grew older. At about the end of the first year of schooling, whether it was kindergarten or elementary school, English had already become the child's dominant language. If the parents insisted at this critical moment that the ethnic language be used at home, the child's Chinese was maintained and further developed along with English. Otherwise, it levelled off or declined and was even lost.

For the six children who immigrated at school age, the pattern was quite different. These children were exposed only to Chinese until age five or six, and upon arrival in Canada, were put immediately into an English-speaking school (kindergarten or Grade One), and immersed in the English-speaking environment of neighbors, peers, and TV. If the family continued to use Chinese, the child's Chinese was maintained as his English developed; in the one case in which, because of the family's anxiety about the child's

English, Chinese was not used often at home, the child's Chinese deteriorated.

Results of the English Tests

Following the age grouping established in Marckworth (1977b), Derwing (1976), and Burt and her colleagues (1975), the subjects in the current work were divided into two groups, the younger group, consisting of seven 6-7 year-olds, and the older group, seventeen 8-12 year-olds. Generally speaking, almost all of the subjects' performance on any English test except Derivational Morphology can be described as comparable to that of monolinguals. In the Derivational Morphology test, the younger group lags behind their monolingual counterparts on certain derivational linguistic processes, while the older group reveals, however, a dramatic catch-up in all but one process, adjective formation. This replicates Marckworth's (1976b) results. The detailed results will be presented in the following sections.

Based on the test scores of the Syntax English test all of the subjects tested except one (case #17) should be categorized as having achieved Level Five which signifies a level as proficient as their English counterparts. Even the one who did not achieve the Proficient Level scored

eighty-five, which is in the Intermediate Level according to Burt and her colleagues (1975). (Case #17, whose scores are aberrant in all of the English tests had arrived from Taiwan only a year ago and had thus been exposed to English for the minimum time allowed for inclusion in our subject pool.) The scores obtained by the group range from eighty five to one hundred with a mean score of 96.66 and a mode of 98.

In terms of performance on the individual functors, we have two interesting observations. Eighty-four percent of the subjects in our study failed to acquire the structure conditional perfect (hereafter CP). Broken down by age groups, none of the younger group acquired the CP structure, and even the percentage of the older subjects having acquired CP structure is astonishingly low, a mere twenty-three percent, almost as low as the national standard for grades K-2, twenty-one percent. Despite the low structure scores on CP, all of the subjects except case #17 acquired all other functors tested in the Syntax English test. Case #17 thus gives us the only information on the order of acquisition of functors. He failed to master auxiliary, plural, past irregular, and conditional perfect, having structure scores for these functors of 83, 50, 33, and 0 respectively. He managed to acquire all other functors. The rank order of functor acquisition, as demonstrated by the structure scores for case #17, is,

- (1) auxiliary
- (2) plural
- (3) past irregular
- (4) conditional perfect auxiliary

This rank order can be compared with that of Burt and her colleagues (1975, p.20).

- (1) auxiliary
- (2) plural
- (3) past irregular
- (4) (conditional) perfect auxiliary
- (5) past participle

It is observable that these two rank orders are almost identical with the exception of past participle, which all ninety percent of the subjects in Burt's sample had not acquired. Nevertheless, this study seems to confirm that there is possibly a universal rank order of English functor acquisition by learners from different language backgrounds and monolinguals alike.

The results of performance on the nonsense forms in the Derivational Morphology test are summarized in the following table and are compared with the results obtained by Derwing (1976) and Marckworth (1977b).

Of the five English morphological processes, the younger Chinese group scored fairly low on three of them and did not

Table 4

Percent Correct Scores on the Derivational Morphology Test
(Nonsense Forms Only)

Morph. Process	English (5-7 yrs)	Chinese (6-7 yrs)	English (8-10 yrs)	Chinese (8-12 yrs)
CPD	49	100	65	100
AGENT	44	14	80	76
INST	26	0	45	70
ADJ	20	0	55	23
ADV	8	28	20	47
	N=55 (from Marckworth)	N=7	N=40 (from Derwing)	N=17

even reach onset (defined as the age level at which no child uses the process productively) on instrumental and adjective formation, but performed better on noun compounding and Adverb. The older Chinese group scored reasonably high on noun compounding, and agentive, and instrumental formation, but failed to acquire and use the other processes, adjective and adverb formation, productively. When compared with the monolinguals' performance, the younger Chinese group lagged behind in three morphological processes, and exceeded in two. This result may come from the fact that the younger Chinese group did not have five-year-olds in the sample. If the results are analyzed year-by-year, it is observable that, for the six-year-old Chinese bilinguals, only one

process reaches onset, while for their monolingual counterparts, noun compounding, and agentive, and instrumental formation are already productive (Marckworth 1977b, p.12). For the seven-year-old Chinese bilinguals, noun compounding and adverb formation are productive, but instrumental and adjective formation are still pre-onset. Such a comparison can be shown more clearly by Table 5.

Table 5

Comparison of Younger Chinese and English Children's
Performance on the Derivational Morphology Test

Morph Process	English Age 6	Chinese Age 6	English Age 7	Chinese Age 7
CPD	product	product	product	product
AGENT	product	pre-onset	product	onset
INST	product	pre-onset	product	pre-onset
ADJ	onset	pre-onset	onset	pre-onset
ADV	onset	pre-onset	onset	product

To summarize the results of the Derivational Morphology test, two points can be made. First, the younger Chinese

group, especially the six-year-olds, lagged behind English monolinguals in control of four morphological processes, and the seven-year-olds, though still behind in three processes, started to show some development in agentive and instrumental formation and even went a bit ahead in adverb formation. Second, the older group exhibit a dramatic catch-up in all but one process, adjective, and moved a little bit ahead in noun compounding, instrumental, and adverb formation. In short, the Derivational Morphology scores for the older group are comparable to those of monolinguals, if not better. Finally, the findings presented in the Marckworth bilingual study (1977b) are replicated and confirmed by the current work.

The test scores on the Word Association-English test, ranging from 13 to 20 where 20 is the maximum possible, are unexpectedly high with a mean score of 18.45 and a mode of 20. Thirty-seven percent of the subjects obtained a score of 20, including even three of the six and seven-year-olds. A decision was made to compare the Chinese bilinguals' Word Association-English test scores with those of English-speaking college students who were learning Chinese in the East Asian Program at the University of Alberta, by using a Kruskal-Wallis analysis of variance.

The Kruskal-Wallis analysis of variance, as Table 6 shows, reveals that the mean ranks for both groups are

fairly close and the corrected chi-square for ties is merely 0.087 which is statistically insignificant. It seems that there is no difference between these two groups, and the Chinese bilingual children performed as well as the English monolingual adults on the Word Association-English test. This result is totally unexpected. Further analysis will be made in the following section to correlate the linguistic scores with social factors, and at that time an attempt will be made to explain this unexpected finding.

Table 6

The Kruskal-Wallis Analysis of Variance
Chinese Children by Canadian Adults on the Word
Association-English Test

<u>Lq. Groups</u>	<u>Number</u>	<u>Mean Ranks</u>
Chinese	24	15.73
Canadian	6	14.58

.....

cases=30, chi-square corrected for ties = 0.087
level of significance =0.76

Results of the Chinese Tests

In the case of the Syntax Chinese test, the results show that sixteen percent of the subjects have lost the active control of Chinese (which their parents reported them to have had in earlier years) and failed to continue to take the test, (this happens when the child fails to respond to at least three test questions in the first block). Another twenty-five percent barely went through the test with fragmentary Chinese, only recognizable by an experienced linguist. This twenty-five percent can be categorized as below Survival Level, using Burt's classification system. One of these subjects apparently was not pleased with the test result at all, remarking that

You should have come here to play this linguistic game with me last year. I was still pretty good at that time. You know I have not practiced my Chinese for a long time. Will you come back next year? I will be able to do much better by then (subject #19).

This subject was a just-entered-grade-two girl of 7 years who tried desperately hard to retrieve her Chinese from memory, but failed, very abashed. Among those who finished the test with greater ease, another twenty-five percent of the total group could be termed "proficient." Since all of them except one also scored more than 95 on the Syntax Acquisition Index in the Syntax English test and are thus

categorized as "proficient" in English as well, it seems proper to classify this twenty-five percent of the subjects as balanced bilinguals. A further twenty percent of the subjects were at the Intermediate Level, and thirteen percent at the Survival Level. From this post-interview statistical analysis, it should be pointed out that the parents' judgements of their children's linguistic ability were admirably accurate.

Of the two Chinese tests, the Word Association-Chinese test was the more popular with the subjects. For one thing, it seemed to the children easier to do than the Syntax Chinese test. They felt comfortable and smiled a bit when they could respond without fail. Indeed, only sixteen percent of the subjects gave up on this test. Contrary to the subject's judgement that the Word Association-Chinese test was easy, the scores were not impressive, however. The score range spreads from 0 to 20 with 7.25 as the group mean score and 2 as the mode. Except for twenty-five percent of the subjects who scored as high as 17-19, the rest obtained a score below 11. Twenty is the maximum on this test.

The results of the Code-Switching test are very disappointing. Nearly one-third of the subjects could not do it at all, and another one-third seemed unsure of the task; therefore, further analysis was discontinued. Those who could do it were the same subjects who also scored better on the

other two Chinese tests.

The Relationship between Social Factors and Linguistic Variables

In order to probe deeply into the social factors that might operate to influence a child's language development, the data collected were subjected to nonparametric tests. The rationale for adopting nonparametric tests for the present study was essentially as follows (cf. Siegel 1956, p. vii). First of all, since the nonparametric tests do not assume that the scores under analysis were originally drawn from a normally distributed population, they are often construed as "distribution free." Furthermore, many of the nonparametric tests are virtually "ranking tests," hence they are applicable to scores which are basically ordinal measurements. Besides, the nonparametric techniques are also inherently suitable to small samples, a feature, as Siegel rightly pointed out, which is helpful to the researcher whose samples are small "because of their very nature (e.g., samples of persons with a rare form of mental illness, or samples of cultures)."

The Kruskal-Wallis one-way analysis of variance was applied to fifteen social factors and five linguistic scores separately with the latter as dependent variables.

Linguistic Variables

- 1) Syntax English
- 2) Syntax Chinese
- 3) Derivational Morphology
- 4) Word Association-English
- 5) Word Association-Chinese

Social Factors

- 1) Age
- 2) Sex
- 3) Birth Order
- 4) Siblings
- 5) Birthplace
- 6) North America (age when
arrived in North America)
- 7) English Environment
(age when put into
the English environment)
- 8) Parent's Judgement
(parent's judgement of
his child's English and
Chinese)
- 9) TV Exposure
- 10) Read English
(hours per week in reading English)
- 11) Learning Chinese
(how important did parents judge this to
be)
- 12) Father-child (the language
father uses when speaking
to his child)
- 13) Mother-child (the language
mother uses when speaking
to her child)
- 14) Child-parent (the language
child uses when speaking
to his parents)
- 15) Bilingual Exposure Score (see Appendix D)

Analyses of Age Groups and Linguistic Scores

The Kruskal-Wallis one-way analysis of variance for the Syntax English scores with age is summarized in Table 7. The Kendall correlation coefficients for social factors with linguistic variables are given in Appendix E.

Table 7
Kruskal-Wallis Analysis of Variance
the Syntax English by Age

<u>Age</u>	<u>Number</u> <u>of Subj.</u>	<u>Mean Ranks</u>
6 yrs.	3	4.00
7 yrs.	4	8.50
8 yrs.	4	8.63
9 yrs.	2	8.50
10 yrs.	5	17.50
11 yrs.	2	17.50
12 yrs.	4	20.00

.....

Cases=24 chi-square corrected for ties=16.04
level of significance=0.01

The strength of the association of age with the Syntax English scores is indicated by the Kendall tau, 0.66, which is significant at the 0.001 level. A close examination of

the mean ranks for different age groups reveals that the mean ranks increase steadily with the age except group four (age 9) whose rank is even lower than that of group three (age 8). The corrected chi-square for ties is 16.049 which is statistically significant at the .01 level. This data-analysis seems to suggest that the child's Syntax English score is a function of age. Such a finding is again confirmed by the data analysis of Derivational Morphology, another English test, whose result is shown in Table 8.

Table 8

Kruskal-Wallis Analysis of Variance
Derivational Morphology by Age Groups

<u>Age</u>	<u>Number</u> <u>of Subj.</u>	<u>Mean Ranks</u>
6 yrs.	3	2.50
7 yrs.	4	9.63
8 yrs.	4	11.63
9 yrs.	2	14.50
10 yrs.	5	12.40
11 yrs.	2	20.50
12 yrs.	4	18.88

Cases = 24 chi-square corrected for ties = 12.908
level of significance = 0.045

The Kendall correlation coefficient between age and Derivational Morphology is 0.56, a little lower than the 0.66 for age and Syntax English. However, it is also significant at the level of 0.001. The Kruskal-Wallis Analysis of Variance for Derivational Morphology shows the corrected chi-square is 12.908, again lower than 16.049 for Syntax English, but still statistically significant at 0.045 level. The results of both English tests, especially Syntax English, apparently point out the critical importance of age as a determinant factor in language development which, of course, is not a surprising conclusion. However, the non-significance of the Kendall correlation coefficient between age and the Word Association-English test is totally unexpected. The near-zero correlation coefficient, 0.06, and the disappointingly low chi-square (corrected for ties), 4.159, were not in line with the previous suggestion that the Word Association-English test is a function of maturity. Such a disconfirmation necessitates further data-analysis and discussion, which will be found in the next section.

The Kendall correlation coefficients for age and the two Chinese scores, the Syntax Chinese test and the Word Association-Chinese test, are 0.14 and 0.12 respectively, which are not statistically significant. The Kruskal-Wallis analysis of variance for the Syntax Chinese test and age and the Word Association-Chinese test and age reveal two sets of low and non-significant chi-squares (corrected for ties),

4.021 and 4.865, with p equal to 0.674 and 0.561 respectively. One conclusion can readily be drawn upon this analysis. If the different age groups are taken as a developmental trend, it seems to suggest that as the child grows up, his Chinese, unlike his English, is not necessarily getting better. If this is so, a father (case #7) appears to be justified commenting that "we are fighting a losing battle. When the child grows up, he will lose his Chineseness as well as the Chinese language. The English-speaking environment is just too overwhelming to resist."

Non-significant Social Factors

The Kruskal-Wallis analysis of variance was applied to all social factors and linguistic variables, but it resulted in low and insignificant chi-squares for linguistic scores with the following social factors: Sex, Birth Order, Siblings, Birthplace, TV Exposure, Mother-child, and Bilingual Exposure Score.

It has been implied in the literature (Kuo 1972) that birth order might be an important factor in language development. The reasoning runs like this. By the time the second-born child is ready to learn a language, he can learn it from his older sibling and practice with him whose knowledge of the particular language will be good enough to

serve as a model and companion. Consequently, we would expect that the second-born child's English in the same developmental stage might be better than his elder brother/sister who had no such a chance before. On the other hand, the second-born child's Chinese might be worse than the first-born's, since his older sibling, schooled in the English environment, would prefer to communicate in English with him, provided that English is freely allowed for use at home. This suggestion is not confirmed by the current study, however. The Kendall correlation coefficients for five linguistic variables, Syntax English, Syntax Chinese, Derivational Morphology, Word Association-English, and Word Association-Chinese with Birth Order were very low and insignificant. The Kruskal-Wallis analyses of variance also yielded low corrected chi-squares for the aforementioned five linguistic variables with Birth Order.

The factor TV Exposure seemed to be a potentially important determinant in language acquisition. A parent (case #19) reported that his daughter had not known English until she went to kindergarten at the age of five. The English she knew was mainly from watching TV programs, such as Seesame Street. Most of the children interviewed were enthusiastic TV watchers. Those who attended Edmonton Chinese School on Saturday morning were always found to complain that they hated Chinese school, because they could not watch the Saturday morning TV programs.

In order to examine the strength of association of TV Exposure with linguistic scores, the Kendall correlations were performed. It was found that all the Kendall correlation coefficients for linguistic scores with TV Exposure were fairly low and insignificant. The same statistical results were obtained from the Kruskal-Wallis analyses of variance. This leads to the inevitable impression that though television may affect a young child's EARLY language acquisition as parents reported, it is not as influential to the older child's LATE language development as it was credited with being.

The factor, Bilingual Exposure Score, was designed to investigate especially how much English or Chinese is used at home by the parents and how much Chineseness is maintained by the family. The Kruskal-Wallis analyses of variance for the five linguistic variables with the Bilingual Exposure Score yielded low corrected chi-squares, 14.37 for Syntax English, 13.92 for Syntax Chinese, 14.893 for Derivational Morphology, 11.09 for Word Association-English, 18.37 for Word Association-Chinese, with twelve degrees of freedom, which are rejected at the 0.10 level of significance. It may be concluded that whatever language the parents use between themselves at home, if it is not used to communicate with the child, is unlikely to influence the child's performance in linguistic

tests.

Analyses of Social Factors as Determinants of English Scores

The following social factors are significant determinants of English scores, viz. North America, English Environment, and Read English.

As defined in the previous section, the factor North America refers to the age at which the child arrived in North America in order to determine precisely how long he has been influenced by a complex of communication factors. English Environment is the number of years he has been in a predominantly English-speaking milieu. The factors North America and English Environment are highly correlated for this sample. The Kruskal-Wallis analyses of variance for Syntax English and Derivational Morphology with North America give the corrected chi-squares 9.91 and 11.13, with four degrees of freedom each, which are significant at the levels of 0.04 and 0.02 respectively. Thus, it suggests that the longer the child has lived in North America the better is his English.

The factor, Read English, was designed to find out how many hours the child spends reading English books. Among the English scores, only the the Word Association-English test achieves statistical significance in the Kruskal-Wallis

analysis of variance. Table 9 presents the analysis of variance for the Word Association-English test.

Table 9

Kruskal-Wallis Analysis of Variance

The Word Association-English Test by Read English

<u>Reading Hrs.</u> <u>Per Week</u>	<u>Number</u> <u>of Subj.</u>	<u>Mean Ranks</u>
5 hrs.	3	3.33
6 hrs	2	6.75
7 hrs.	1	2.00
8 hrs.	4	10.63
10 hrs.	6	13.08
12 hrs.	3	17.83
14 hrs.	1	20.00
15 hrs.	4	20.00

Cases=24 chi-square corrected for ties=17.436
level of significance=0.01

As Table 9 shows, with one exception the mean ranks increase smoothly with the increase of hours spent in reading. The Kendall correlation coefficient for the Word Association-English test with Read English is quite high, 0.75, and is significant at the 0.001 level. The Kruskal-Wallis analysis of variance also yield the high

corrected chi-square, 17.436, with seven degrees of freedom, which is significant at the 0.01 level. The data-analysis reveals that if the child spends more time reading English books, he is more likely to do better in the the Word Association-English Test.

What emerges here is the connection of reading and mature word association reponses. This is the other side of the coin discussed by Bickley and his colleagues (1971) and Otto (1976), in which mature word association scores correlated with high reading readiness scores. Whatever facet of language ability these tests tap, it is apparently the SAME facet.

Analyses of Social Factors as Determinants of Chinese Scores

Three social factors stand out in the data-analysis as significant determinants of high Chinese scores, namely, Learning Chinese, Father-child, and Child-parent.

Learning Chinese is a factor designed to determine how important the parents think the learning of Chinese is. As detailed in the previous section, fifty percent of the parents view the learning of Chinese as either helpful or enjoyable. None of them, even the strongest advocate of

balanced bilingualism, is willing to place learning Chinese on the same level of importance as learning English. Half of the parents say the learning of Chinese is important, however. The Kruskal-Wallis analyses of variance for the Syntax Chinese test and the Word Association-Chinese test with Learning Chinese are presented in Table 10 and Table 11.

Table 10
Kruskal-Wallis Analysis of Variance
Syntax Chinese by Learning Chinese

<u>Importance</u> <u>Judgement</u>	<u>Number</u> <u>of Subj.</u>	<u>Mean Ranks</u>
enjoyable	6	5.50
helpful	6	7.83
important	12	18.33
.....		
Cases=24 chi-square corrected for ties=17.99		
level of significance=0.0001		

The mean ranks in Table 10 and Table 11 increase when greater importance is placed upon the learning of Chinese,

Table 11

Kruskal-Wallis Analysis of Variance

Word Association-Chinese by Learning Chinese

.....

<u>Importance</u> <u>Judgement</u>	<u>Number</u> <u>of Subj.</u>	<u>Mean Ranks</u>
enjoyable	6	4.92
helpful	6	10.17
important	12	17.46

.....

Cases=24 chi-square corrected for ties=13.747
level of significance=0.001

namely, from Group One who rated it as enjoyable, Group Two as helpful, to Group Three as important. Just as the large significant chi-square demonstrates, the child performed better the more the parents viewed the learning of Chinese as important. A similar pattern was observed when the relationship between Father-Child or Child-Parent and the Chinese scores had been explored by Kruskal-Wallis analyses of variance. The results were summarized in Tables 12, 13, 14, 15. It should be noted that the more the father spoke Chinese to the child or the child to either parent, the better the child performed in the Chinese tests.

Table 12

Kruskal-Wallis Analysis of Variance
Syntax Chinese by Father-Child

<u>Frequency</u> <u>of usage</u>	<u>Number</u> <u>of Subj.</u>	<u>Mean Ranks</u>
sometimes	5	5.50
often	10	10.50
mostly	9	18.61

.....

Cases=24 chi-square corrected for ties=13.414
level of significance=0.001

Table 13

Kruskal-Wallis Analysis of Variance
Word Association-Chinese by Father-Child

<u>Frequency</u> <u>of usage</u>	<u>Number</u> <u>of Subj.</u>	<u>Mean Ranks</u>
Sometimes	5	5.20
often	10	11.90
mostly	9	17.22

.....

Cases=24 chi-square corrected for ties=9.620
level of significance=0.008

Table 14

Kruskal-Wallis Analysis of Variance
Syntax Chinese by Child-Parent

<u>Frequency</u> <u>of Usage</u>	<u>Number</u> <u>of Subj.</u>	<u>Mean Ranks</u>
sometimes	11	7.64
often	6	14.08
mostly	7	18.79

.....

Cases=24 chi-square corrected for ties=11.917
level of significance=0.003

Table 15

Kruskal-Wallis Analysis of Variance
Word Association-Chinese by Child-Parent

<u>Frequency</u> <u>of Usage</u>	<u>Number</u> <u>of Subj.</u>	<u>Mean Ranks</u>
sometimes	11	7.91
often	6	13.83
mostly	7	18.57

.....

Cases=24 chi-square corrected for ties=10.229
level of significance=0.006

The Relations among Linguistic Variables

To explore the interaction among linguistic variables, the Kendall correlations were investigated for the five linguistic scores. The results are described below.

First of all, as stated in Chapter Three, it is interesting to know whether the English scores correlate with one another and, if so, in what manner. A high correlation among them would ensure that dependable English scores had been derived. This is also true for the two Chinese test scores. The strength of the association of Derivational Morphology with Syntax English is manifested by the Kendall tau of 0.50 which is significant at the 0.001 level. Based on this statistical analysis, it can be concluded that the better the subject performs on Syntax English, the higher he will score in Derivational Morphology. The positive correlation also exists between Derivational Morphology and the Word Association-English Test although with a weaker strength of association. Compared with Kendall tau of 0.50 for Derivational Morphology with Syntax English, the strength of association between the Word Association-English test and the Derivational Morphology is weaker as shown by the Kendall correlation coefficient 0.38, which is still significant at the 0.009 level. The statistical analyses done so far indicate that these two sets of scores, Syntax English and

Derivational Morphology, and Derivational Morphology and Word Association-English, are positively correlated. However, the picture is slightly different for the scores of the Syntax English test and the Word Association-English test. When the Kendall correlation was made for the Word Association-English Test and the Syntax English test, the result showed a very weak association between these two linguistic variables. The Kendall tau was a mere 0.15 which is even not significant at 0.10 level, indicating very little variation between them; the reason for this is that, as described in the second section of this chapter, almost all of the subjects scored fairly high in both the Syntax English test and the Word Association-English test.

There is also a strong, positive correlation between the Syntax Chinese test and the Word Association-Chinese test which was shown by Kendall tau 0.48 which is significant at 0.001 level; this is additional and convincing evidence of the claim that both tests are good measures of language ability.

Since the Syntax English and the Word Association-English tests have their counterparts in the Chinese tests, it is methodologically justifiable to make comparisons of scores on the Syntax English test and the Syntax Chinese test and on the Word Association-English test and the Word Association-Chinese test. Both sets of scores

were tested by Kendall correlations. The Kendall correlation coefficient for the Syntax English test with the Syntax Chinese test is 0.21 which is significant at 0.10 level. Although the result of this statistical analysis is not particularly decisive, it seems not to support Macnamara's "balance-effect" theory. In exploring the relationship between the Word Association-English test and the Word Association-Chinese test, the Kendall tau was computed for these two sets of scores. The result was a positive correlation, 0.39 which is significant at 0.008 level. This result, similar to that obtained from the Syntax English test and the Syntax Chinese test, again does not support Macnamara's "balance-effect" theory.

General Discussion

Two major areas of interest emerge from the statistical analysis presented above. The first is the characteristics of our particular subject pool. The second is characteristics of the language tests and how they relate to each other. The statistical analysis suggests that one-fourth of the subjects can be described as balanced bilinguals who have native-like control of both languages, a number not impressively high for this particular sample, in which the opportunity for equal proficiency in both languages has been abundantly present. If we take these balanced bilinguals as

the upper-end of a continuum, the lower end is the sixteen percent of the subjects who failed totally to respond in the Chinese tests. Since ALL of the parents interviewed reported that they speak to the children in Chinese but the children may reply in English, this segment of the sample can be categorized at least as receptive bilinguals; their passive knowledge of Chinese may have been underestimated, however, since, in the actual testing situation, these children were not allowed to respond in English; consequently they simply said "I can't do it." In the middle range of the continuum are the subjects who are not clearly either one thing or the other; these subjects tended to have quite proficient English but their Chinese covered a fairly wide range of ability.

Macnamara's balance-effect hypothesis (1966), which predicts that "if a child develops skills in one of his two languages, he generally pays for it by a deficit in the other" (p.vi), seems to be too broad a contention to be fully accepted in view of the general results obtained in this study. The hypothesis was only correct in predicting the Chinese test scores of the sixteen percent of the subjects who were categorized as receptive bilinguals, since they achieved a level in English comparable to that of monolinguals in Syntax English and the Word Association-English test but failed in the Syntax Chinese test and the Word Association-Chinese test. However, to a

majority of the subjects in the sample, having access to two different linguistic systems did not appear to cause one language to suffer unduly when the other prospered. More interestingly, this study suggests why different patterns of bilingualism develop in individuals (even individuals from a seemingly homogeneous group) by showing what sorts of external social and experiential factors influence development in both the home, ethnic language and the second, community language.

All of the subjects except one (#17) performed extremely well in two of the English tests, Word Association-English test and Syntax English, and achieved a level comparable to that of English monolinguals. The Word Association-English test has been confirmed by recent studies as being highly correlated with reading scores (Bickley, Dinnan, and Jones, Otto 1976). In this study, the factor, Read English (the actual hours children spent in reading English books weekly) was found to be a function of the Word Association-English test, that is, the more hours children spent in reading English books, the better they performed in the Word Association-English test. If Bickley and his colleagues' and Otto's findings and arguments are accepted, it is justified to speculate that, based on the subjects' excellent performance on the Word Association-English test, that the Chinese bilinguals may perform in a reading test at a level comparable to that of

monolinguals as well. If so, this study may INDIRECTLY refute Chen's (1964) argument that bilingualism is a detrimental factor "in the inferior performance of the bilingual's reading."

Although all of the subjects except #17 are categorized as "proficient," the highest level in the Syntax English, the functor conditional perfect auxiliary, was a problem to all of them. A similar rank order of functor acquisition was obtained in this study as in those of Burt and her colleagues using the same test. This generalization is limited, however, due to very small number of subjects who made errors on the test in our study.

In the Derivational Morphology test, the younger Chinese children, especially the six-year-olds, lagged behind their English monolingual counterparts in all but one morphological process (noun compounding). The seven-year-olds are still behind their monolingual counterparts in instrumental and adjective formation, but already show good development in agentive formation and signs of catching up. The older children exhibit a dramatic catch-up by moving a bit ahead in some processes.

In addition to scoring the nonsense forms in the Derivational Morphology test, performance on the real English forms was also analyzed. It was found that among the

older children, seventy percent used all of the five morphological processes productively and obtained perfect scores. Even in the younger group, forty-three percent have full control of four morphological processes in the real forms, lacking only adjective formation. These real forms may have been memorized by the subjects in real life situations and, when needed, retrieved from memory. We may thus speculate that, in bilingual language acquisition, more memorization than occurs with monolinguals may precede productive rule acquisition.

In the post-interview period, two children who were not satisfied with their the Word Association-Chinese test responses made a special request that they would like to answer the Word Association-Chinese test in English while the experimenter said the stimulus in Chinese, a pattern these bilingual children are most accustomed to. To satisfy their pride the request was granted. Separate records of the the Word Association-Chinese test scores answered in English were kept for these two subjects (#12, #20) but were not entered into the main statistical analysis presented above. The first subject (#12) had performed poorly in the Word Association-Chinese test when responding in Chinese (as he realized), achieving a score of only five, but his Word Association-Chinese test score when responding in English went up to eighteen, almost comparable to his Word Association-English test score of nineteen. A similar result

was obtained for subject #20. His Word Association-Chinese score when he answered in English went up to seventeen from three when he answered in Chinese, and was comparable to his Word Association-English score of twenty. This special experiment, originally designed only to satisfy two young boys' pride, has some unexpected value because of its implications. We must first note what the non-paradigmatic responses of these two were when they responded in Chinese. If they do not respond to the stimulus word at all, we can assume only that they do not have productive control of enough lexicon. However, if they give syntagmatic responses, we will have evidence that the tests tap language maturity, and not a more general cognitive maturity as has been claimed. In fact, the latter case was what occurred. The following example illustrates the sort of difference seen between the two response languages. The stimulus shou "hand" was responded to by both subjects with da "hit" in Chinese but foot in English. This generalization is limited, of course, because it is derived from two subjects only. Future research done along this line may be more revealing.

The most important determining factor for good performance on both the Syntax English test and the Derivational Morphology test is age. English Exposure is the length of time the parents estimate a subject has been consistently exposed to English, be it at an English-speaking babysitter's home, in day-care,

kindergarten, or school. Kruskal-Wallis tests were conducted for all linguistic tests with English Exposure. It was found that English Exposure is highly correlated only with the Syntax English test ($p=0.006$) and the Derivational Morphology-Real Form ($p=0.007$). No correlation was obtained with the Syntax Chinese test, the Derivational Morphology test (nonsense forms), the Word Association-English test, and the Word Association-Chinese test. It may be speculated that the length of time of exposure to English may determine the acquisition of real forms in English such as those in the Syntax English and the Derivational Morphology-Real Forms, but it may not be sufficient for activities involving productive rule usage such as manipulating the nonsense forms in the Derivational Morphology test. This speculation may reaffirm the explanation about memorization and production made above.

It would be misleading, however, to assert that memorization is all in language acquisition. In the Syntax English test and the Syntax Chinese test, past irregular in English and the measure word in Chinese, both of which require extensive memorization but not much reference to a general productive rule, were difficult to master. In the Syntax Chinese test, all of the subjects invariably used the general form of the measure word ge instead of the appropriate items required for individual nouns. On the other hand, bei construction, which is syntactically

complex, was mastered by sixty-four percent of those who completed the test. The comparison of rank order of functor acquisition in both the Syntax English and the Syntax Chinese leads one to doubt that the notion that formally complex structures are also the most difficult to acquire can be universally true.

Bilingual Exposure Score was not correlated with performance on any of the tests, either Chinese or English. This has several implications. Neither Chineseness maintained at home nor how much Chinese language used by the parents between themselves has any effect on the child's English or on his Chinese. Thus, if the parents want the child to maintain or continue to develop skills in Chinese, speaking Chinese between the couple will not help at all, and if the parents want the child to further develop skills in English, speaking Chinese between the couple does no harm either. Two of the family factors, Learning Chinese and Father-child are highly correlated with the Chinese scores, but not with the English scores. This suggests that if the parents desperately want the child to further develop skills in Chinese, the father should speak Chinese to the child often. Furthermore, that these factors are not positively nor negatively correlated with any of the English test scores implies that speaking Chinese to the child will not influence his development in English language skills at all. These results confirmed studies by Marckworth (1977b), Kuo

(1972), and Ramirez and Politzer (1975).

CHAPTER FIVE

SUMMARY AND SOME SUGGESTED FURTHER RESEARCH

Summary

The principal object of this study, as stated in Chapter One, was exploration. It investigated how the bilingual children of a particular bilingual type perform on various language tests in both their first and second languages, and how a wide range of socio-cultural factors interact with their bilingual language skills and behavior. Such an investigation is of interest to linguists, educators, and parents, who are concerned about the child's ability to function in school using the community language, about his language acquisition, its rate, pattern, and content, and about his language socialization as a bilingual in a predominantly monolingual setting.

A set of very specific questions was asked (see Chapter

Three), and investigated. The following language tests were administered: the Bilingual Syntax Measure-English Version, a Bilingual Syntax Measure-Chinese Version, a Derivational Morphology test, a Paradigmatic/Syntagmatic Word Association-English Version, a Paradigmatic/Syntagmatic Word Association-Chinese Version, and a Code-Switching test. The children's parents were asked to respond to sixty questions designed to scrutinize socio-cultural factors that might affect linguistic variables. Performance on the language tests and responses to the socio-cultural questionnaire were correlated.

The results reveal that all but one of the Chinese bilingual children performed as well as their English monolingual counterparts on the Syntax English test and that their English could be categorized as "proficient", according to the classification set up by Burt and her colleagues (1975). An unexpectedly high proportion of their responses in the Word Association-English test were also unmistakably paradigmatic, a result not different from that of English-speaking university students, established by a Kruskal-Wallis one-way analysis of variance. However, the younger group of the Chinese bilingual children (6-7 years old) lagged behind their English monolingual counterparts in three morphological processes in the Derivational Morphology test, although the older ones (8-12 years old) exhibited a performance comparable to or better than monolinguals in all

except one morphological process, namely, adjective formation. This seems to suggest that at a certain stage in the learning of the second language, as Peal and Lambert (1962, p. 548) speculated in their review of previous studies, a bilingual might be behind his monolingual counterpart but catch up at a later stage. Henderson and Silverman (1973) also report:

For children who entered the school in kindergarten or the early elementary grades, assimilation into the regular program requires about three years. In that time, these students catch up with their English speaking peers on measures of school achievement (p. 16).

Similar results were detailed in Marckworth (1977b), as well. This finding may partially explain why the bilingual subjects performed as well as, if not better than, the monolingual children in previous studies such as those of Arsenian (1937) whose subjects were of age 9 to 14, Yeung (1921) whose subjects were overrepresented by 9 to 10-year-olds, and Kline and Lee (1972) whose subjects' reading disability at the end of Grade Three was much lower than the reported national average. In the Chinese tests, sixteen percent of the subject were shown to have lost their active control of Chinese in both the Syntax Chinese test and Word Association-Chinese test, and consequently can be described as receptive bilinguals only. One-fourth of the Chinese children tested by the Syntax Chinese test could be categorized as "proficient" in Chinese and deserve to be

called "balanced bilinguals." The remainder were distributed among the intermediate level (20%), and the survival and below survival level (39%). In the Word Association-Chinese test, again only one-fourth (the same one-fourth) of the subjects scored as high as 17-19 out of 20, and the rest obtained scores below 11, with 7.25 as the group mean, far worse than their scores on the comparable English test.

The most important factors influencing English scores, especially the Syntax English test and Derivational Morphology-Real Form, are age and years exposed to English. Contrary to the previous studies, Word Association tests were not found to be correlated with age in the current work. Rather, it was a function of the hours spent in reading. The Derivational Morphology test was predictable by age.

The Chinese scores were highly positively correlated with how important the parents think Chinese is and how often the parents, especially the father, speak to the children in Chinese.

It should be noted that language tests used in the current work might be refined in further studies of this sort. The English tests were chosen because there was normative information available on them, and the Chinese tests were constructed to parallel them. However, on the

basis of the present exploratory study more detailed and informative tests might be developed.

In concluding this section, it should be pointed out that since the bilingual children in this study, who came from an upper-middle class, highly education-oriented immigrant group, performed in English tests more like monolinguals than did the children from lower social strata, it suggests that many of the problems with the language of children from lower SES must stem from social factors than factors engendered by having and using two language systems.

Chapter Three ended with a list of specific research questions to be investigated in this exploratory study. They are repeated here with their answers.

1) Do the bilingual children lag behind the monolinguals in general?

No, only in the early years (6-7 years old) and then only on the Derivational Morphology test.

2) Is age an important variable? Does the 9-12 age group approximate its monolingual counterpart in performance?

Yes.

3) Is the acquisition order of English functors similar to results obtained by other investigators?

Yes, insofar as could be determined from our sample, who were so proficient in English as to deny us many errors to analyze.

4) Are the bilinguals' scores on the

Derivational Morphology test highly correlated with those in the Syntax English?

Yes.

5) Is the family use of Chinese a significant variable in the English tests?

No.

6) Is parental expectation related to all performance scores?

Expectations about learning Chinese are highly correlated with scores on Chinese tests. Since expectations about learning English were uniformly high, we can only assume that they influenced the uniformly high English scores.

7) Does family bilingual orientation influence the bilinguals' Chinese scores? Is it the case that the more the family is Chinese language oriented, the better the Chinese scores, but not the English scores?

No.

8) Are the bilinguals' Word Association-English scores highly correlated with the Derivational Morphology and the Syntax English tests?

Yes.

9) Do paradigmatic responses increase with age in both Chinese and English versions?

No.

10) Is it the case that the more paradigmatic responses, the better the code-switching scores?

Since the code-switching test proved impossible for two-thirds of the subjects, it was not included in the analysis.

11) Is it the case that the higher the English exposure scores, the higher the Derivational Morphology and the Syntax English scores?

English exposure was divided into subfactors, of which years in an English-speaking environment influenced Syntax and that part of Derivational Morphology concerned with real English forms.

Some Suggested Further Research

The exploratory nature of this study makes it unsurprising that many more questions are raised by it than are answered. Following are a few of the most interesting.

As discussed in Chapter Four, there is a drastic imbalance between the Word Association-English and the Word Association-Chinese test scores; therefore, it was suggested that the Word Association test might be a measure of language maturity. If such an imbalanced response pattern prevails in future research, it may be considered that solid evidence has been obtained for asserting that a word association test is a measure of language maturity rather than general cognitive maturity.

The relationship between various sorts of linguistic

tests indicated in this study shows just the tip of the iceberg in language development. The Derivational Morphology test exhibits a different acquisition pattern from the Syntax English and the Word Association-English tests. Is derivational construction a later-developing skill because it is cognitively more difficult, or just less communicatively necessary than basic syntax? The wide-spread use of the general measure word ge in Chinese by the subjects in this study to replace the specific measure words generally required for an adult seems to suggest that the later may be the case, because the basic measure word ge is communicatively sufficient. In the same way, the child who substitutes mud boy for the pattern, adjective + Noun, muddy boy, is giving a communicatively adequate response, even if it is still syntactically non-adult. Future research on the acquisition of meanings independent of adult forms is suggested by this. In particular, a study of specific measure words in Chinese, their development, pattern, and content, may shed some light on this problem.

The external factors considered in the current work were explored from the parents' viewpoint; for instance, attitudinal factors were investigated by asking the parents how important they think the learning of Chinese is. It would be interesting to examine the children's attitude, as well. Such considerations may be operationalized in a question such as, "How do you describe learning of Chinese?"

It can be measured by enjoyable, instrumental, encouraged by parents, forced to learn, and useless and like to forget about it.

Finally, what would be the result if some of the social factors that were constants in our rather homogeneous sample were tested as variables, for example, composition of peer group? (Subjects in our sample without exception socialized in a primary peer group that was exclusively English monolingual.) On the basis of results obtained in the study, we might predict that the inclusion of some other Chinese speakers in the primary peer group would not influence a subject's English, but might affect his Chinese. However, the influence and interaction of the peer group of the immigrant bilingual child may be more complex than we suppose. Toward the conclusion of this study, Emily, the author's thirty-eight-month old daughter, who previously had heard and spoken only Chinese, began attending an English-speaking day care center for eight hours a day. Within two months' time her monologing was completely in English, although she continues to speak to her bilingual parents in Chinese. Furthermore, other older children in the Chinese-English group (some of them subjects in this study) soon after she began to attend day-care started speaking to Emily entirely in English, although previously they had used only Chinese to her (to get their toys back from her).

These are just a few research questions that were immediately apparent after the completion of this study. Despite the many questions remaining, this study has answered the major problems that worry the parents of children of the sort in our sample. The bilingualism patterns and prognosis for the development of both Chinese and English in our subjects has been usefully and fruitfully explored.

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APPENDIX A
TEST MATERIAL FOR SYNTAX CHINESE TEST*

1. jei shr shemma? you dwoshau ne? "What are these? How many are they?"
2. ta naje myanbau yau dzwo shemma? "What's he going to do with the bread?"
3. weishemma yau chr? "Why does he want to eat it?"
4. jei shr sheide maudz? "Whose hat is this?"
5. you dwoshau hwa ne? "How many flowers are there?"
6. jeige fangdz dzenmayang? "How's the house?"
7. neige fangdz dzenmayang? "How's that house?"
8. neige men dzenmayang? "How's that door?"
9. jeige men ne? "How's this door?"
10. ta weishemma ju dzai jeir? "Why does he live here?"
11. weishemma tamende dzwei bije? "Why do you think their mouths are closed?"
12. weishemma tamende dzwei kaije? "Why do you think their mouths are open?"
13. jeige ren dzai dzwo shemma? "What's he doing?"
14. weishemma? "Why?"

15. jei shr sheide syedz? "Whose shoes are these?"
16. jeige nyuhaidz dzwo shemma? "What's the girl doing?"
17. jei shr sheide ji? "Whose chicken is this?"
18. ji bei shei chr le? "The chicken was eaten by whom?"
19. pinggwo dzenma le? "What happened to the apple?"
20. gwowangde ji bei tou le, ta jywede dzenmayang? "The king's chicken was stolen. What do you think he felt?"

* The pictures used in this test were those from the Bilingual Syntax Measure (Burt et al. 1975).

APPENDIX B
TEST MATERIALS FOR DERIVATIONAL MORPHOLOGY

Expected Response	Subject's Response
a. <u>doghouse</u>	1.
b. <u>neaver</u>	2.
c. <u>glurky</u>	3.
d. <u>slowly</u>	4.
e. <u>teeby</u>	5.
f. <u>dosher</u>	6.
g. <u>muddy</u>	7.
h. <u>singer</u>	8.
i. <u>blighly</u>	9.
j. <u>pointer</u>	10.
k. <u>heesply</u>	11.
l. <u>zabehouse</u>	12.
m. <u>yurser</u>	13.
n. <u>cumer</u>	14.
o. <u>oogcatcher</u>	15.

APPENDIX C
TEST MATERIALS FOR THE CODE-SWITCHING TEST

1. They don't / yung kwaidz "use chopsticks"
2. Her beautiful / shu "book"
3. They want / lai "come"
4. Richard / chr fan "eat"
5. His favorite / tsai "dish"
6. They want to / lai "come"
7. You / chr fan "eat"
8. He can / pau "run"
9. You don't / chyu "go"
10. He can / yung kwaidz "use chopsticks"
11. I don't / jrdau "know"

1. Jang Shan / go "John Doe"
2. women yau / read "we want"
3. wo bu / skate "I don't"
4. wode / steak "my"
5. women yau / to read "we want"
6. wode/ hotdog "my"
7. wo hwei / skate "I can"
8. tamen bu / come "they don't"
9. nide po / clothes "your worn"
10. women yau / read "we want"

11. gege / go "the older brother"
12. wo hwei / to skate "I can"
13. ni / go "you"
14. wo hwei / skating "I can"

APPENDIX D
QUESTIONNAIRE ON SOCIOLINGUISTIC BACKGROUND

Subject's full name:

Home language:

Age:

Grade:

Sex:

Date:

1. What is the name you call your child at home?
2. Date of birth of the child:
3. Birth order of the child:
4. Number of siblings:
5. Where was your child born?
6. (If not born in North America) when did he first arrive in North America?
7. How long have you and your child lived in Edmonton?
8. What was the earliest language exposure of your child?
 - a. Chinese only
 - b. Chinese but with some English
 - c. Both about equal
 - d. English but with some Chinese
 - e. English only
9. What was the earliest language tendency of your child and why?
 - a. Chinese only

- b. Chinese but with some English
 - c. Both about equal
 - d. English but with some Chinese
 - e. English only
- Why?

10. How old was he when you first noticed such a tendency?

11. When and in what manner was your child aware of the existence of two languages in his environment?

12. How old was your child when you started putting him regularly in an English-speaking environment like:

- a. baby-sitter's home
- b. day-care center
- c. nursery school
- d. kindergarten
- e. pre-school
- f. elementary school

13. How do you compare your child's Chinese and English?

- a. His Chinese is very much better
- b. His Chinese is a little better
- c. Both about equal
- d. His English is a little better
- e. His English is very much better

14. Which language, English or Chinese, does your child use with the following people or in the following situations?

- a. always Chinese
- b. mostly Chinese
- c. both about equal
- d. mostly English
- e. always English

- 1) Talking to other Chinese children
- 2) When he is angry or cursing
- 3) When he is talking to himself

15. On the average, how many hours is your child exposed to:

- 1) television:
- 2) radio broadcasting:
- 3) Chinese records:
- 4) Chinese cassette tapes:
- 5) English records:
- 6) English cassette tapes:

16. On the average, how many hours do you (or your wife) read English or Chinese stories to your child weekly?

- 1) Chinese stories:
- 2) English stories:

17. On the average, how many hours does your child read English or Chinese stories to you or your wife weekly?

- 1) Chinese stories:
- 2) English stories:

18. On the average, how many hours does your child read English or Chinese stories to himself after school?

- 1) Chinese stories:
- 2) English stories:

19. Can you name three of your child's best friends?

- 1) name:
- 2) age:
- 3) nationality:
- 4) average hours of weekly contact:

20. Are your neighbors English-speaking Canadians?

21. At school, your child's favorite courses, in order of preference are:

22. The three courses he dislikes most, in order, are:

23. Concerning your child's education, you have

- 1) never said anything about it
- 2) asked him to work instead
- 3) asked him not to continue after high school
- 4) encouraged him to continue if possible
- 5) strongly encouraged to continue

24. What do you think of your child's learning of English or Chinese?

- 1) unimportant
- 2) enjoyable
- 3) helpful
- 4) important
- 5) very important

a. Chinese

b. English

25. Information about husband and wife

- a. place of birth:
- b. year of birth:
- c. years in North America:
- d. years of education:
- e. highest degree:
- f. major field:
- g. occupation:
- h. pre-immigration occupation:

The following scale is used to indicate frequency of practices.

- a. never
- b. sometimes
- c. often
- d. mostly
- e. always

- 26. Does the husband speak to the wife in Chinese?
- 27. Does the wife speak to the husband in Chinese?
- 28. Does the father speak to the children in Chinese?
- 29. Does the mother speak to the children in Chinese?
- 30. Do the children speak Chinese to the father?
- 31. Do the children speak Chinese to the mother?
- 32. Do the children speak to one another in Chinese?
- 33. Do the children speak to the cohabitant in Chinese?
- 34. Does the cohabitant speak to the children in Chinese?
- 35. Does the husband read any Chinese newspaper or magazines?
- 36. Does the wife read any Chinese newspaper or magazines?
- 37. Does the husband read any books in Chinese?
- 38. Does the wife read any books in Chinese?
- 39. Are there any books in the Chinese language in the family?

40. Does the husband write any letters in the Chinese language?
41. Does the wife write any letters in Chinese?
42. Are letters written in Chinese received in the home (excluding business letters)?
43. Are records or tapes given in the Chinese language listened to in the family?
44. Does the husband attend Chinese movies?
45. Does the wife attend Chinese movies?
46. Do the children attend Chinese movies?
47. Does the husband attend social activities (parties, lectures, dinners, dances, etc.) with people that speak mostly Chinese?
48. Does the wife attend such activities?
49. Are there any family visitors who speak Chinese?
50. Does the family as a whole visit any family friends who speak Chinese?
51. Does the family have Chinese food for supper (as compared with Canadian food)?
52. What kind of food do your children prefer?
 - 1) Chinese
 - 2) Chinese-Canadian
 - 3) about equal
 - 4) Canadian-Chinese
 - 5) Canadian

53. What kind of influences do the TV have on the language development of your children, in your assessment?
54. How about radio?
55. How about records and tapes?
56. How about storybooks?
57. How about your children's best friends?
58. What kind of influence do you think the bilingual experience may have on the intellectual development of your child?
- 1) some positive influence
 - 2) some negative influence
 - 3) no influence
- Please elaborate why.
59. How about emotional adjustment?
- 1) some positive influence
 - 2) some negative influence
 - 3) no influence
- Please elaborate why.

60. Any general comment on the language development of your child? Any problem? Satisfied?

APPENDIX E
KENDALL CORRELATION COEFFICIENTS FOR SOCIAL FACTORS AND
LINGUISTIC VARIABLES

Abbreviations

BSM-E: Bilingual Syntax Measure-English Version

DMT-R: Derivational Morphology Test-Real Form

DMT-N: Derivational Morphology TEST-Nonsense Form

PST-E: Word Association Test-English

BSM-C: Bilingual Syntax Measure-Chinese Version

PST-C: Word Association Test-Chinese

Note: the first line specifies Kendall's correlation coefficient and the second line, level of significance.

<u>FACTORS</u>	<u>BSM-E</u>	<u>DMT-R</u>	<u>DMT-N</u>	<u>PST-E</u>	<u>BSM-C</u>	<u>PST-C</u>
Age	.67 .001	.60 .001	.56 .001	.06 .34	.14 .19	.13 .21
Sex	-0.18 .17	-0.36 .03	-0.29 .05	-0.34 .04	.01 .48	-0.10 .30
Birth Order	-0.21 .13	-0.25 .10	-0.05 .38	.09 .31	-0.20 .14	-0.09 .30
Siblings	.15 .20	.13 .25	.24 .09	-0.07 .36	-0.07 .35	-0.13 .24
Birth Place	.19 .15	.21 .14	.12 .25	-0.11 .28	.07 .35	-0.10 .30
North America	.22 .10	.25 .08	.15 .18	-0.01 .46	.24 .08	.10 .28
English Year	.73 .001	.48 .003	.56 .001	.12 .23	.18 .15	.10 .26
Parent Judge	-0.08 .33	.006 .49	.12 .25	.01 .48	-0.73 .001	-0.52 .002
TV Exposure	-0.11 .25	-0.04 .42	.10 .28	.28 .06	-0.12 .24	.16 .17

<u>FACTORS</u>	<u>BSM-E</u>	<u>DMT-R</u>	<u>DMT-N</u>	<u>PST-E</u>	<u>BSM-C</u>	<u>PST-C</u>
Read English	.13 .22	.16 .18	.28 .04	.75 .001	-0.01 .49	.36 .01
Learn Chinese	.15 .20	-0.01 .48	-0.06 .37	.10 .30	.75 .001	.67 .001
Father Child	.15 .20	-0.01 .49	-0.10 .29	.09 .31	.66 .001	.54 .001
Mother Child	.14 .21	.11 .27	-0.13 .23	-0.04 .41	.30 .05	.33 .03
Child Parent	.35 .02	.17 .18	.004 .49	.15 .19	.64 .001	.58 .001
Fam Exp Score	-0.06 .35	-0.18 .15	-0.25 .06	-0.02 .46	.29 .03	.21 .08

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